AlpicAir

INSTALLATION AND MAINTENANCE MANUAL

GROUND SOURCE HEAT PUMP WITH DC INVERTER (SPLIT TYPE)

MODEL:

AGH-70WPDC3/AGH-90WPDC3

AGH-120WPDC3/AGH-150WPDC3

CE

- Please Read This Manual Before Using The Heat Pump -

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Principle of AGH-WPDC3 heat pump

AGH-WPDC3 series heat pump can exploit the energy contained in natural heat sources. Or, to put it differently, the heat pump 'collects' heat energy from the heat source.

The heat from the heat source (rock, soil, lake) is taken up via a closed collector system in which a mixture of water and antifreeze circulates; ground water can also be used as a heat source.

The brine emits its heat to the refrigerant in the heat pump's evaporator; it then vaporizes and is compressed in the compressor. The refrigerant, the temperature of which has now been raised, is passed to the condenser where it gives off its energy to the heating medium circuit and, if necessary, to the water tank.

The cycle can be explained in the following stage process:

a. A hose filled with liquid (brine system) is immersed into a lake, dug into the ground or sunk into the rock. The Brine system absorbs the heat energy of the heat source so that the temperature of the water circulating in the hose is raised a few degree;

b. The brine system is circulated to the heat pump's evaporator. Here the heat energy of the Brine system cause the refrigerant, circulating through the evaporator, to boil and turn into a gas- it evaporates;

c. The refrigerant, having absorbed heat energy, is circulated to the compressor where pressure and temperature are raised;

d. The refrigerant continues to go to the condenser. When condensing, it releases heat energy to the heat carrier, circulating through the condenser. The temperature of the refrigerant sinks, and it returns to its liquid state;

e. The heat energy released from heat carrier to water tank or radiator or floor heating systems;

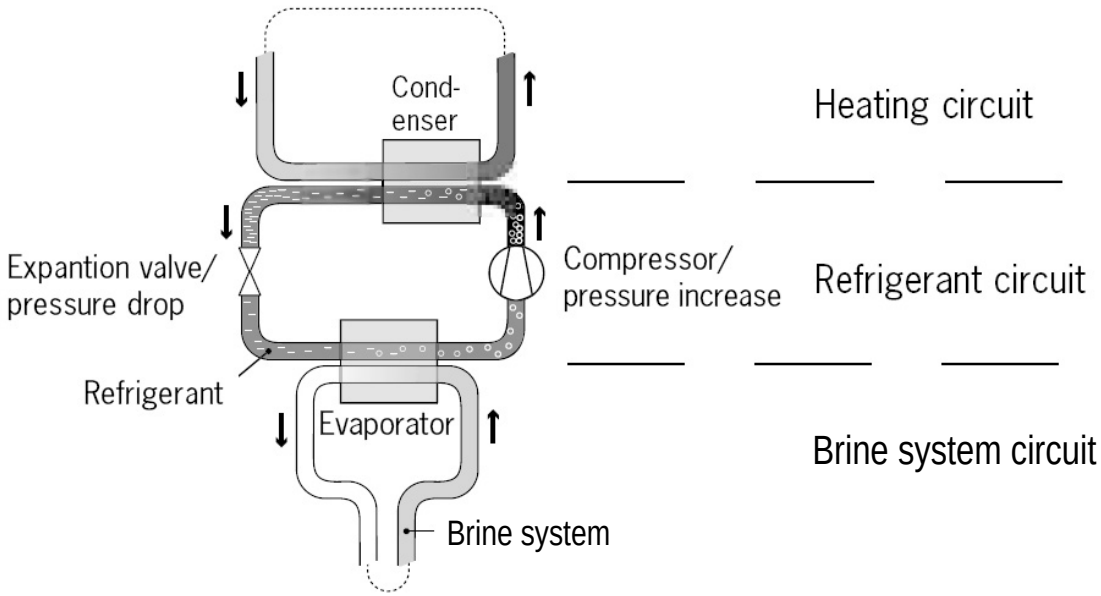
f. Finally the refrigerant is led through the expansion valve, where its pressure is reduced, and then continues to go to the evaporator, ready to start the whole circle once again.

The heat pump has three separate liquid circuits:

Brine system circuit ---- a kind of mixture water (with brine) transports energy from heat source to heat pump;

Refrigerant circuit ---- circulates inside the heat pump, through evaporation, compression and condensation it absorbs energy from the Brine system and releases it to the heat carrier. The refrigerant is chlorine-free;

Heating circuit ---- water transport heat energy to the heating system (radiators/floor coils) or the water tank.



3 System description

Unit General Description

In order to get the best result from the climate system AGH-WPDC3 series, you should read through the section for the system manager in these installation and maintenance instructions;

AGH-WPDC3 is the ground source heat pump with DC inverter; it is a climate system for heating houses and apartment buildings as well as industrial properties.

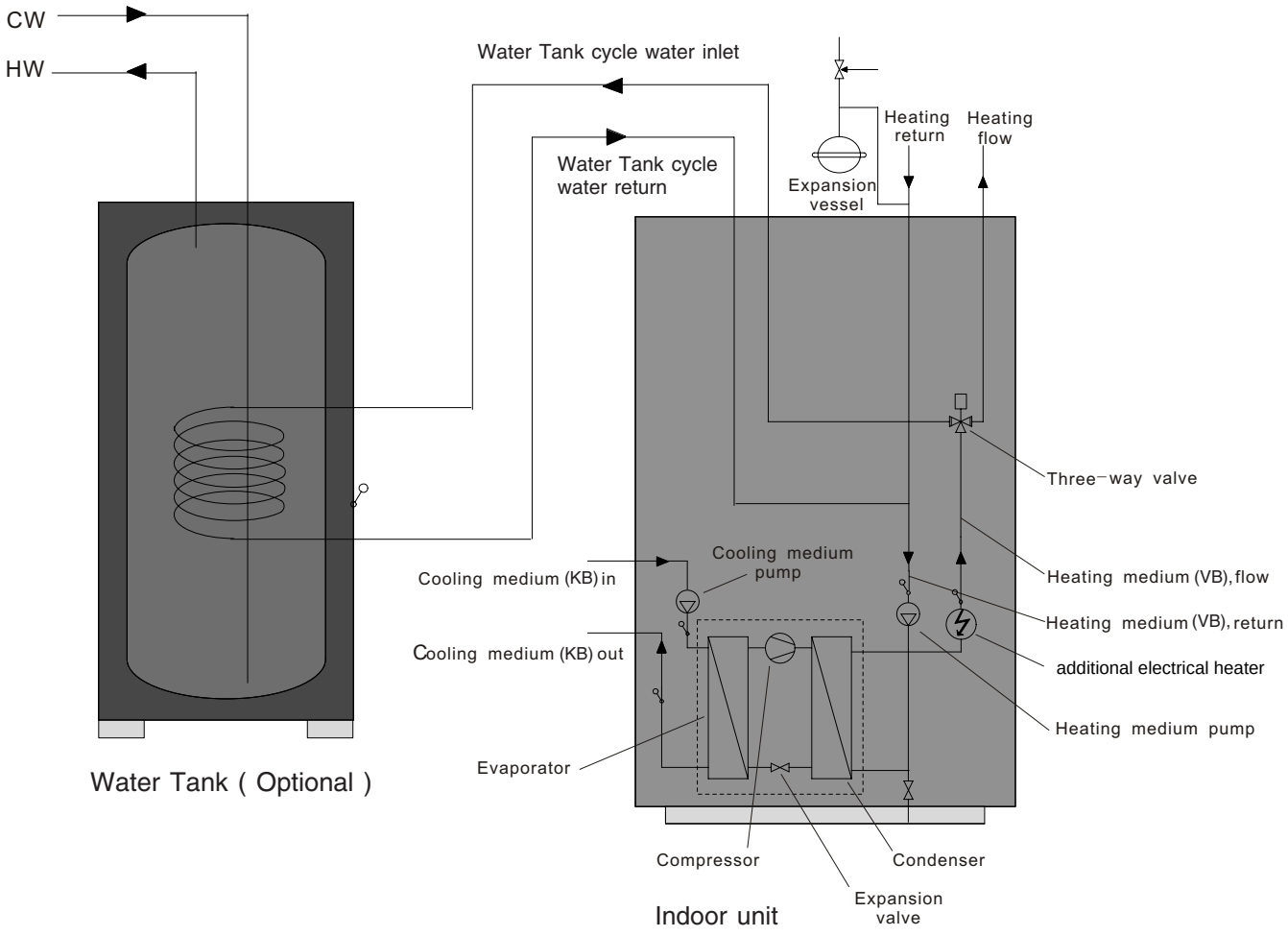
AGH-WPDC3 is a complete heating installation for heating and hot water; water transports heat energy to the heating system (radiators/floor coils) and the water tank;

AGH-WPDC3 series consists of two sections as below:

a. Indoor unit
   Regulating control systems
   Rotary or Scroll type compressor
   Stainless steel heat exchangers
   Circulation pump for heating system
   Circulation pump for brine system
   Valves and safety equipment for refrigerant system
   Three way valve;
   Additional electrical heater

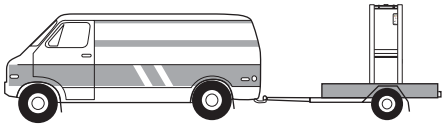
b. Water tank (optional)
   Lined with copper sheet against corrosion and inner with stainless steel
   Maintenance free as no anode is used

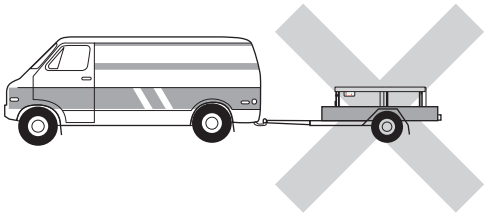
Operation Principle of BWB-SS-DC



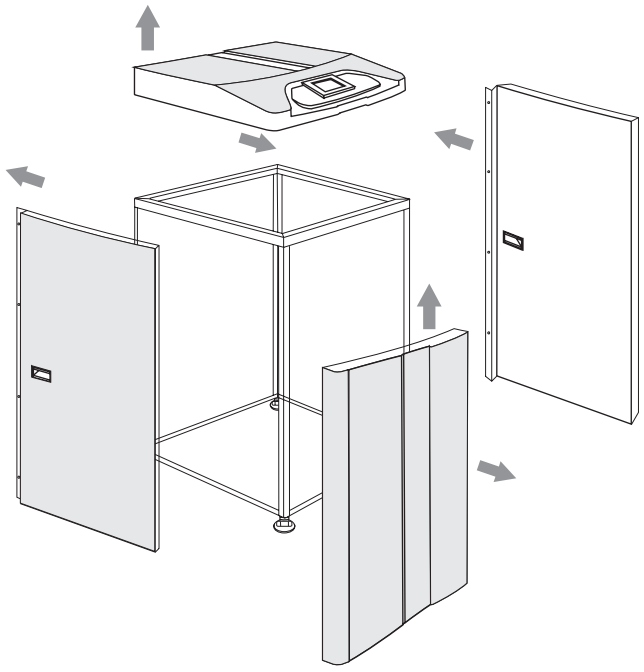
Transport and storage

The AGH-WPDC3 series must be transported and stored upright and dry. The AGH-WPDC3 series may however be carefully laid on its back when being moved into a building.





Overview of external structure



Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and should be documented. The above applies to closed heating systems. If the heat pump is replaced, the installation must be inspected again.

Installation

AGH-WPDC3 series is placed on a firm base, preferably a concrete floor or foundation. Install AGH-WPDC3 series with its back to an outside wall, ideally in a room where noise does not matter. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem. Any wall that backs on to a bedroom should be fitted with sound insulation. Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.

Guideline values for collectors

Type	Surface soil heat, recommended collector length	Rock heat, recommended active drilling depth
7	325 – 2x250 m	120 – 140 m
9	400 – 2x300 m	140 – 170 m
12	2x250 – 2x350 m	160 – 190 m
15	2x250 – 2x350 m	180 – 210 m

For use with 40 x 2.4 PN 6.3 PEM hose.

The length of the collector hose varies depending on the rock /soil conditions and on the heating system, i.e. radiators or floor heating.

Max length per collector should not exceed 400 m.

Where there is more than one collector, they must be connected in parallel, with a means of adjusting the flow.

For surface soil heat, the hose should be buried at a depth of about 1 metre and the distance between the hoses should be at least 1 metres.

For several bore holes, the distance between the holes must be at least 15m.

5 Pipe connections

General

Pipe installation must be carried out in accordance with current norms and directives. The heat pump can operate up to a return temperature of about 58* °C and an outgoing temperature of about 70* °C from the heat pump. The compressor produces up to 65* °C, the rest is obtained using additional heating.

The other heat pumps has a max return temperature of approximately 50 °C and an outgoing max temperature from the heat pump of approximately 60 °C.

Since the AGH-WPDC3 eries is not fitted with shut-off valves, these must be fitted outside of the heat pump to make future servicing easier.

During assembly the pipes for the heat medium and water heater and possibly hot water circulation are routed backwards. The distance between AGH-WPDC3 series and the wall ought to be 50 mm.

NOTICE!

The pipe system needs to be flushed out before the heat pump is connected so that debris cannot damage component parts.

Pipe connections (Brine system)

Factors to be taken into account when designing the collector layout are geographical position, type of rock/soil and cover factor of the heat pump.

When installing the collector hose ensure it rises constantly towards the heat pump to avoid air pockets. If this is not possible, install high points to vent the air.

All collector pipes in heated rooms must be insulated against condensation. The level vessel (NK) must be installed as the highest point in the collector system and on the incoming pipe before the brine pump. Note that condensation may drip from the level vessel. Position the vessel so that this does not harm other equipment.

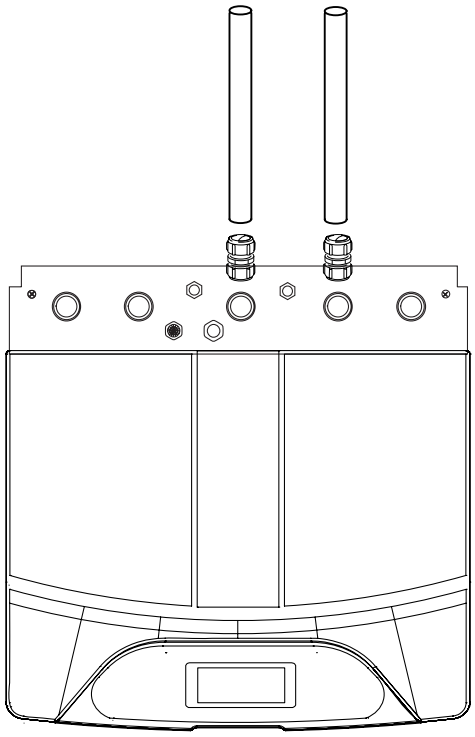
As the temperature of the collector system can fall below 0 °C it must be protected against freezing down to -15 °C. One litre of ready mixed brine per meter of collector hose (applies when using PEM-hose 40 x 2.4 PN 6.3) is used as a guide value when making the volume calculation.

Details of the antifreeze used must be shown on the level vessel.

The collector circuit may be connected from the left or from the right. The lower side panels are swapped over to suit the chosen connection option. The enclosed connecting pipes for the brine are secured using the clips in the punched tabs that are folded down on the side in question.

Shut-off valves should be installed as close to the heat pump as possible. Fit the supplied particle filter on the incoming pipe.

In the case of connection to an open groundwater system, an intermediate frost-protected circuit must be provided, because of the risk of dirt and freezing in the evaporator. This requires an additional heat exchanger.



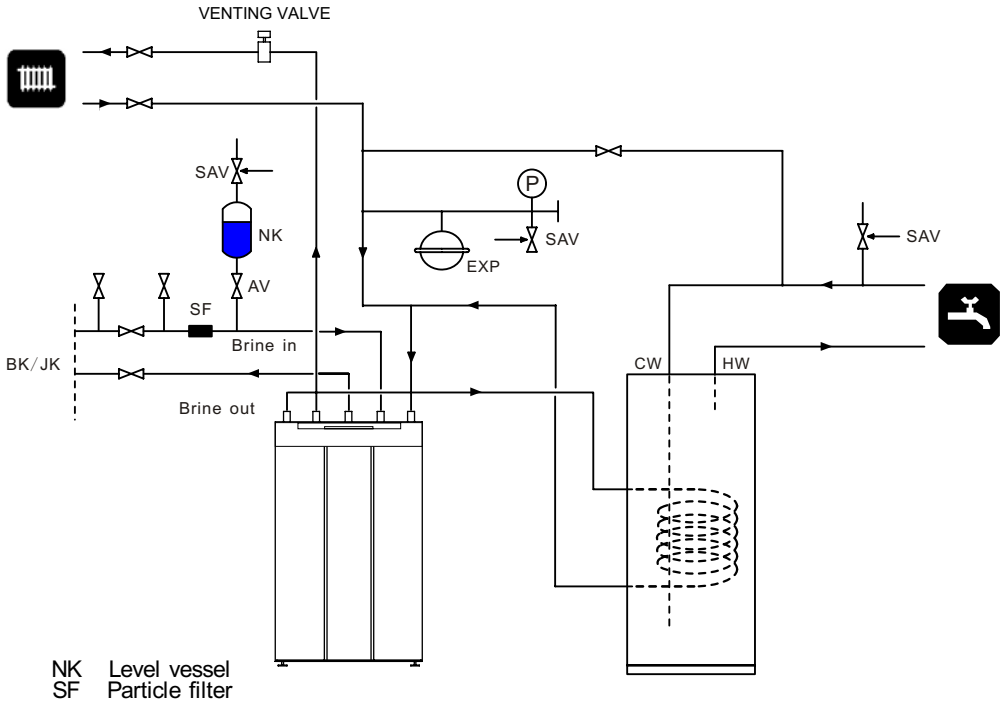
Pipe connections (heating medium)

Pipe connections for the heating medium side are located at the top of indoor unit. All required safety devices, shut-off valves (as close to the heat pump as possible), and particle filter (supplied) are fitted.

When connecting to a system with thermostats on all radiators, a relief valve must be fitted, or some of the thermostats must be removed to ensure sufficient flow.

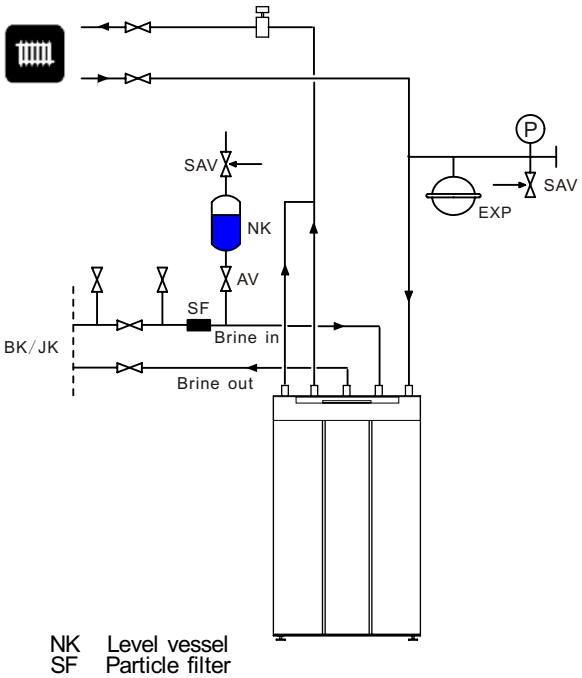
NOTICE!

1. in line filter on the return line;
2. To clean system with a power flush before installing the heat pump and fill with clean water;
3. To use flow gauge to get the correct flow for each unit.



NK Level vessel
SF Particle filter

Pipe connection for floor heating only



NK Level vessel
SF Particle filter

When the system is used for floor heating only, Please connect the pipe according to the diagram, in order to make the system run correctly.

It means the water tank inlet pipe and the floor supply pipe must be connected together as the total water supply pipe.

NOTICE!

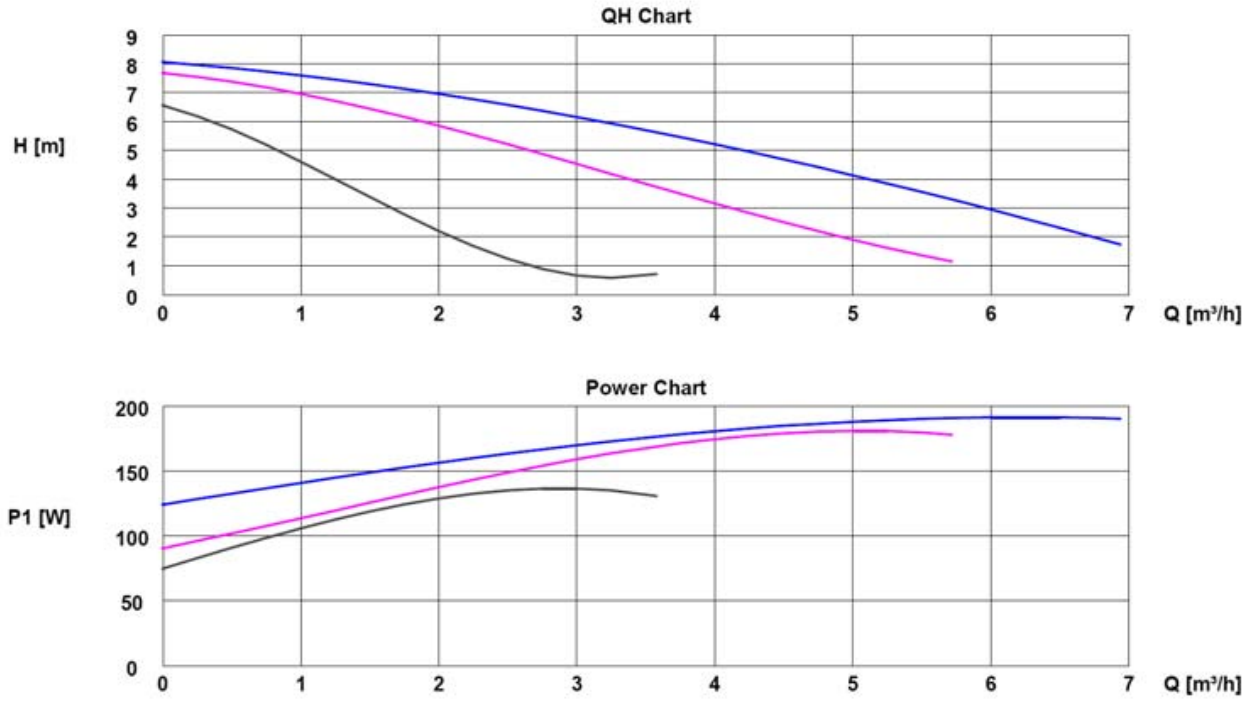
The venting valve should be set on the top of the heating medium system.

7 Pipe connections

Pump capacity diagrams, heating medium side

AGH-70WPDC3 / AGH-90WPDC3 / AGH-120WPDC3 / AGH-150WPDC3

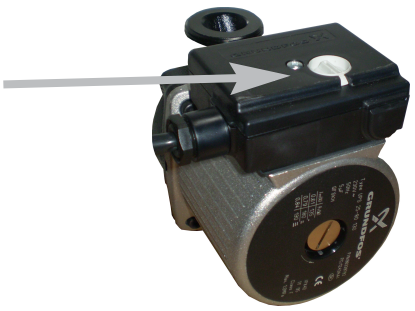
GRUNDFOS UPS 25-80



How to adjust the rate of flow

GRUNDFOS UPS 25-80

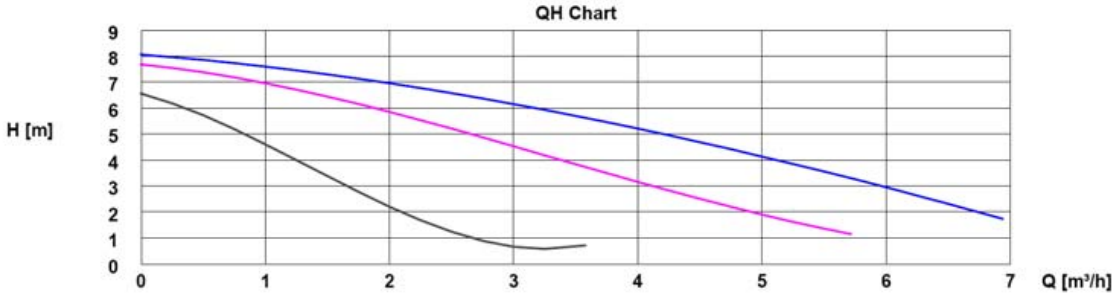
The pump is adjustable to adjust the flow: 1, 2, or 3.



Pump capacity diagrams, collector side

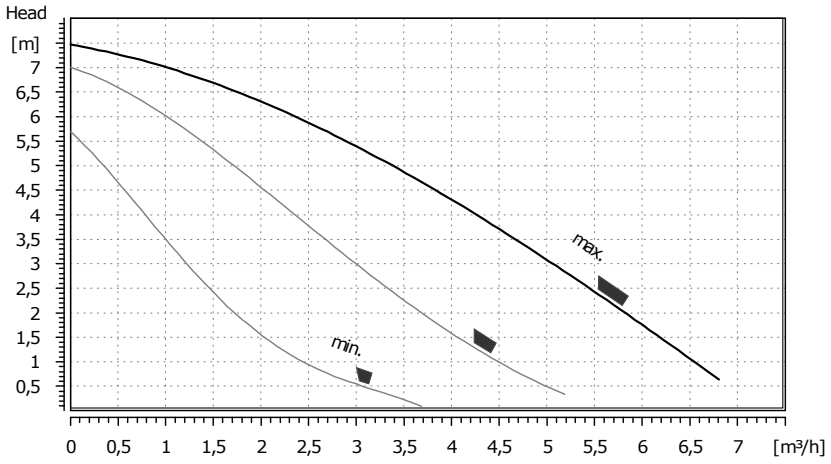
AGH-70WPDC3 / AGH-90WPDC3 / AGH-120WPDC3

GRUNDFOS UPS 25-80



AGH-150WPDC3

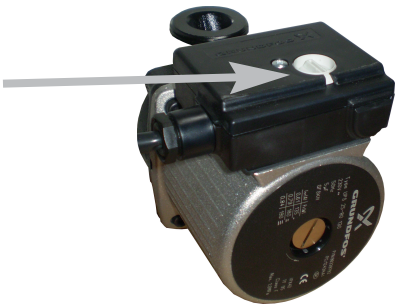
WILO RL-25/7.5



How to adjust the rate of flow

GRUNDFOS UPS 25-80

The pump is adjustable to adjust the flow: 1, 2, or 3.



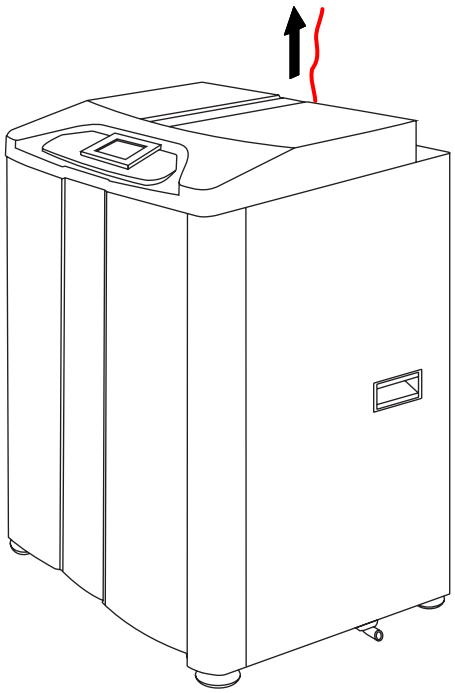
WILO RL-25/7.5

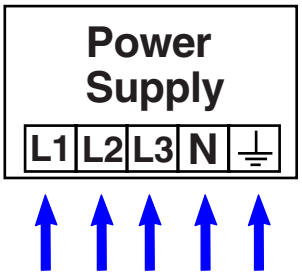
The pump is adjustable to adjust the flow: 1, 2, or 3.

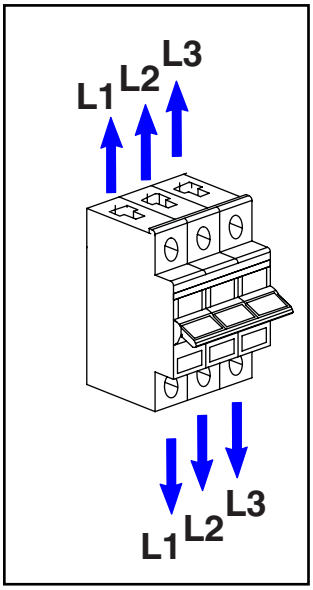
9 Pipe connections

Connection of the power cord

Five core cable (2.5mm2 x 2.1m,5cord)

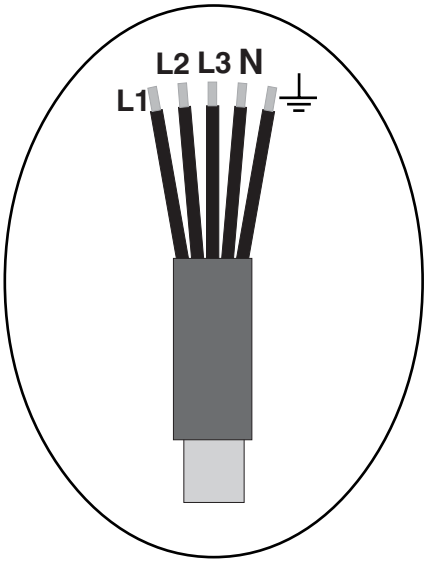


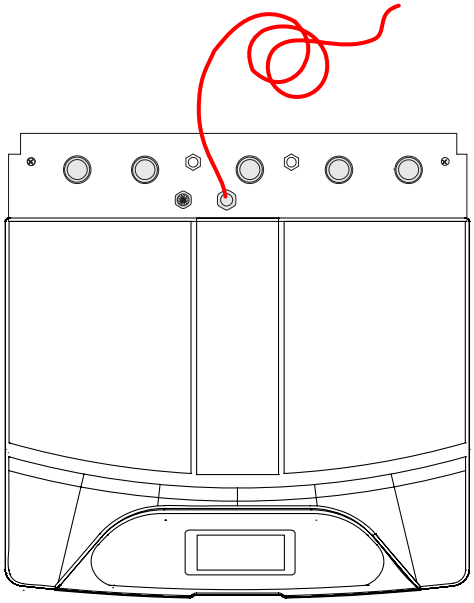




NOTICE!

The power cable of heat pump must connect to a main switch (air circuit-breaker) before to the power supply , to ensure the safety of heat pump.

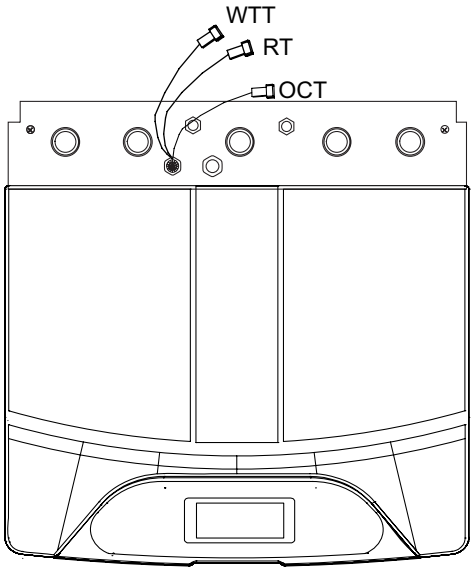




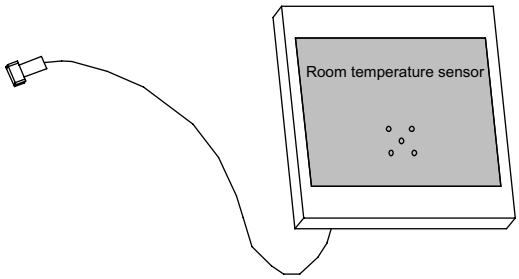
NOTICE!

Electrical installation and service must be carried out under the supervision of a qualified electrician in accordance with the stipulations in force.

Connecting The Room Temperature Sensor

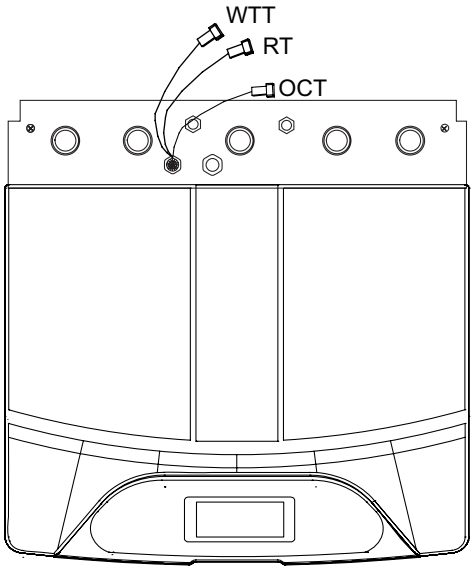


Room temperature sensor

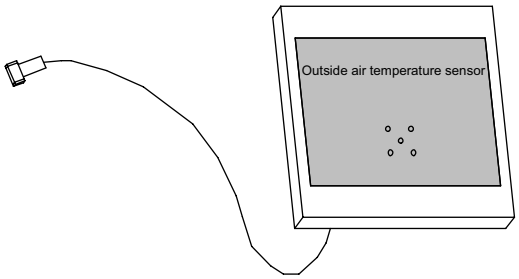


RT=Room temperature sensor

Connecting The Outside Temperature Sensor

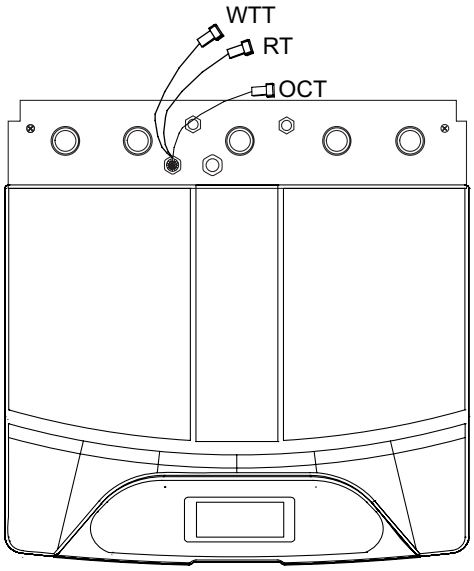


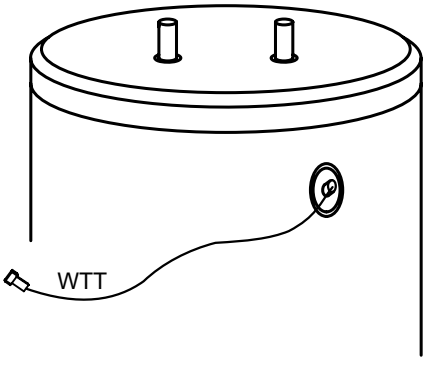
Outside air temperature sensor



OCT=Outside air temperature sensor

Connecting The Outside Temperature Sensor

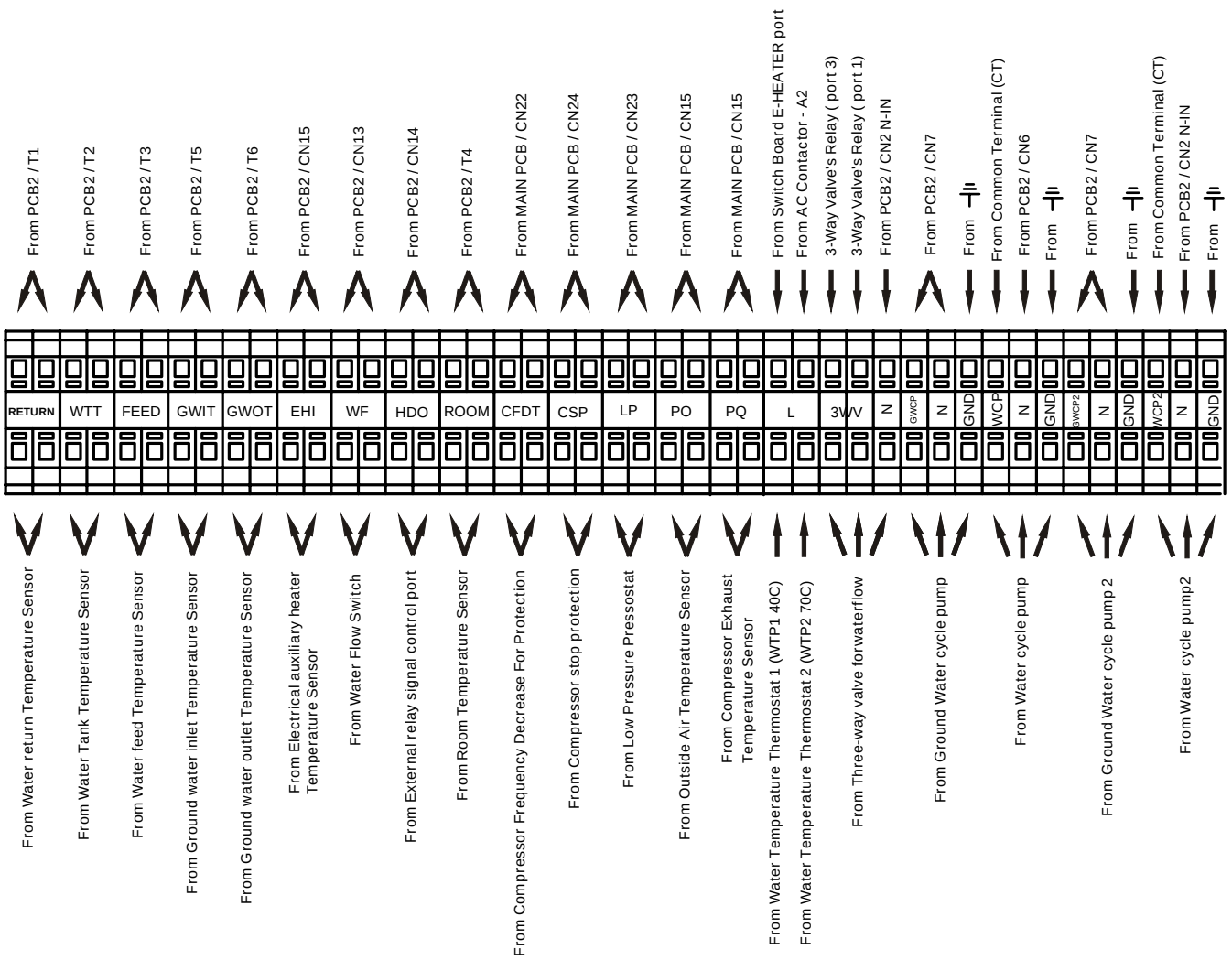




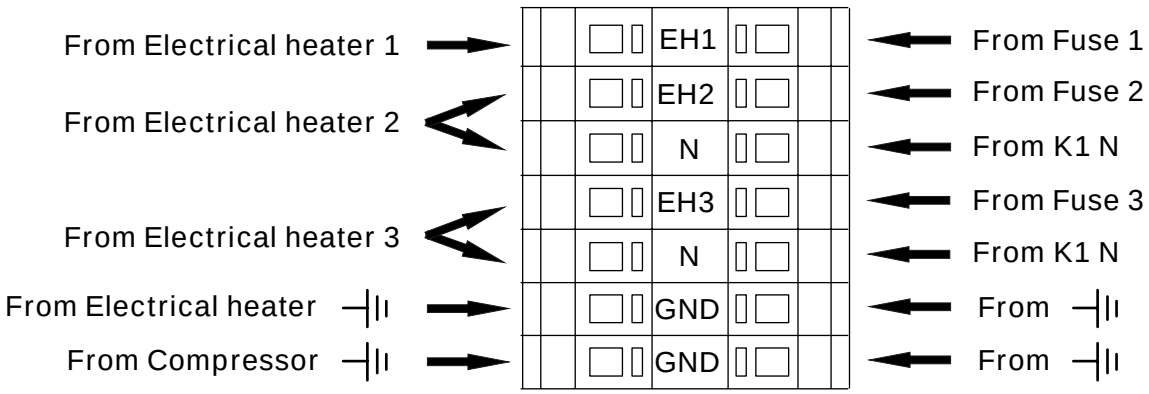
WTT=Water tank temperature sensor

11 Electrical connection

1.5mm2 terminal connection

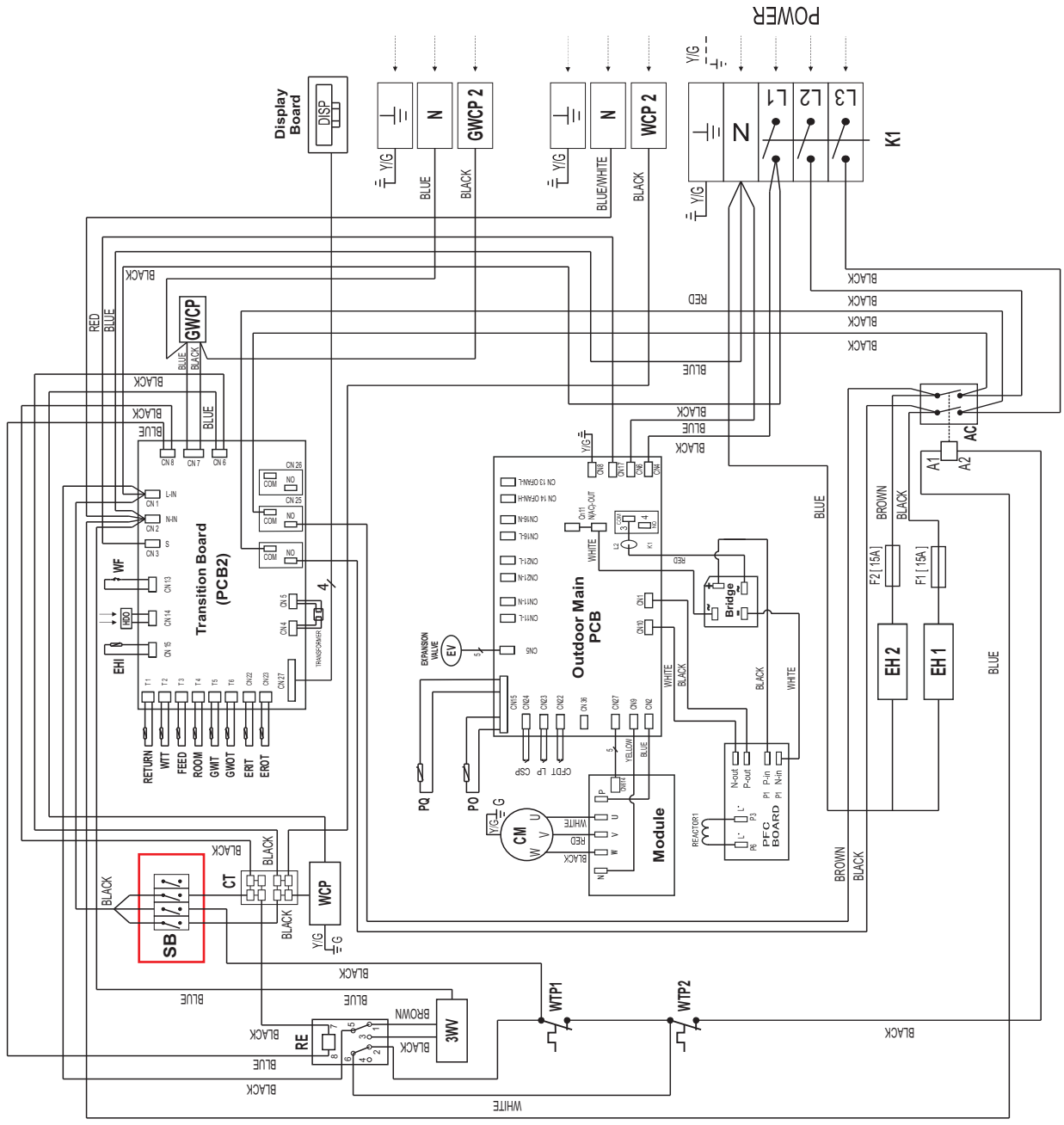


2.5mm2 terminal connection



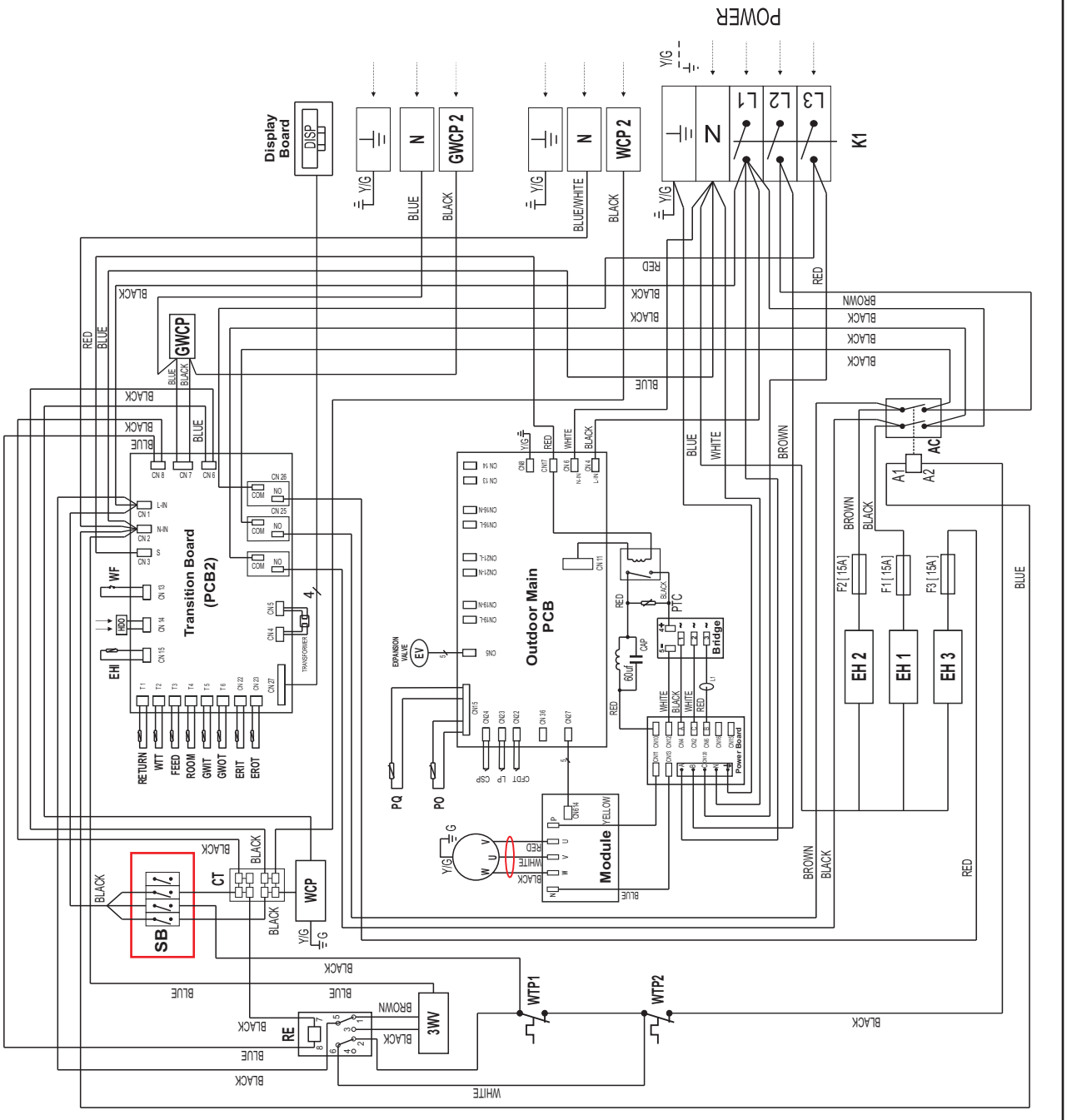
Wiring Diagram (7K / 9K)

K1	Air Break Switch
AC	AC Contactor
SB	Switch Board
CM	Compressor
PCB	Circuit Board
3WV	3 Way Valve
WCP	Water Circulating Pump
WCP2	Water Circulating Pump 2
GWCP	Ground Water Circulating Pump
GWCP2	Ground Water Circulating Pump 2
CT	Common Terminal
RE	Relay for 3 Way Valve
EH 1	Electrical Heater 1
EH 2	Electrical Heater 2
EH 3	Electrical Heater 3
EV	Electronic Expansion Valve
EHI	Electric Heater Temp. Protector
WF	Water Flow Switch
CFDT	Compressor Frequency Decrease For Protection
LP	Low Pressure Switch
CSP	Compressor Stop For Protection (HP)
HDO	External Signal Controls Heat Pump Start and Stop
WTT	Water Tank Temperature Sensor
ROOM	Room Air Temperature Sensor
PO	Ambient Temperature Sensor
PQ	Compressor Discharge Gas Temperature Sensor
FEED	Water Feed Temperature Sensor
RETURN	Water Return Temperature Sensor
WTP1	Water Temperature Protector (40° C)
WTP2	Water Temperature Protector (70° C)
GWIT	Ground Water Inlet Temperature Sensor
GWOT	Ground Water Outlet Temperature Sensor
ERIT	Evaporator Refrigerant Inlet Temperature Sensor
EROT	Evaporator Refrigerant Outlet Temperature Sensor



Wiring Diagram (12K / 15K)

K1	Air Break Switch
AC	AC Contactor
SB	Switch Board
CM	Compressor
PCB	Circuit Board
3WV	3 Way Valve
WCP	Water Circulating Pump
WCP2	Water Circulating Pump 2
GWCP	Ground Water Circulating Pump
GWCP2	Ground Water Circulating Pump 2
CT	Common Terminal
RE	Relay for 3 Way Valve
EH 1	Electrical Heater 1
EH 2	Electrical Heater 2
EH 3	Electrical Heater 3
EV	Electronic Expansion Valve
EHI	Electric Heater Temp. Protector
WF	Water Flow Switch
CFDT	Compressor Frequency Decrease For Protection
LP	Low Pressure Switch
CSP	Compressor Stop For Protection (HP)
HDO	External Signal Controls Heat Pump Start and Stop
WTT	Water Tank Temperature Sensor
ROOM	Room Air Temperature Sensor
PO	Ambient Temperature Sensor
PQ	Compressor Discharge Gas Temperature Sensor
FEED	Water Feed Temperature Sensor
RETURN	Water Return Temperature Sensor
WTP1	Water Temperature Protector (40°C)
WTP2	Water Temperature Protector (70°C)
GWIT	Ground Water Inlet Temperature Sensor
GWOT	Ground Water Outlet Temperature Sensor
ERIT	Evaporator Refrigerant Inlet Temperature Sensor
EROT	Evaporator Refrigerant Outlet Temperature Sensor



Preparations

Before starting up the system, check that the heating, collector and hot water circuits are full and thoroughly vented. Check the pipe system for leakage.

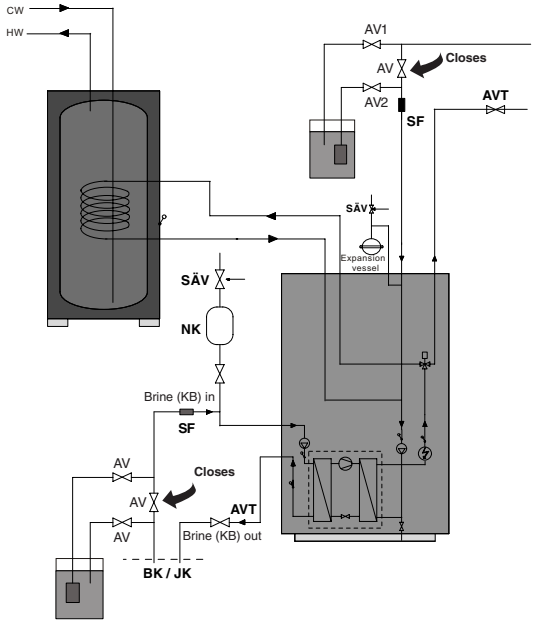
Filling and venting the collector system

When filling the brine system mix the water with antifreeze in an open container. The mixture should be protected against freezing down to about -15 °C. The brine is filled by connecting a filling pump.

1. Check the brine system for leakage.
2. Connect the filling pump and return line on the brine's system's service connections as shown in figure.
3. Close the valve under the level vessel.
4. Close the valve between the service connections.
5. Open the valves on the service connections.
6. Start the filling pump, and fill until there is fluid in the return pipe.
7. Press the power ON botton on the control panel. and start the heating medium pump.
8. The filling pump and the heat pump's brine pump are now operational.
   The fluid should circulate via the mixing container until it emerges from the return hose without being mixed with air.
9. Stop the filling pump and clean the particle filter.
10. Start the filling pump, open the valve between the service connections.
11. Close the valve on the service connection's return line. Now pressurise the system (to max 3 bar) with the filling pump.
12. Close the valve on the service connection closest to the level vessel.
13. Stop the filling pump.
14. Fill the level vessel with liquid up to around 2/3.
15. Open the valve below the level vessel.
16. Select the auto operating mode using the operating mode button.

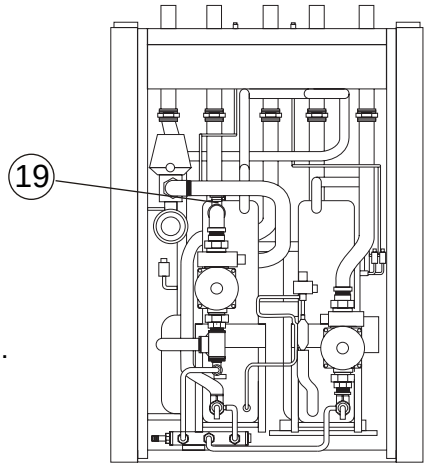
Filling and venting the heating medium system

1. Check the heating medium system for leakage.
2. Connect the filling pump and return line on the heating system's service connections as shown in figure.
3. Close the valve between the service connections.
4. Open the valves on the service connections(AV1,AV2).
5. Pushing the white manual lever down to bottom (this has already been done when the machine leaves factory), then three way valve's water tank port is closed (the "B" port), room heat port is open (the "A" port).
6. Start the filling pump, and fill until there is fluid in the return pipe.
7. Open up Power ON from control panel to start machine, then heat medium water pump is running, the valve will return to the up position when power is restored.
8. Firmly pushing the white manual lever down to midway and in. in this position both the 'A' and 'B' ports are open.
9. The filling pump and the heating medium pump are now operational. The fluid should circulate via the container with tap water until it emerges from the return hose without being mixed with air.
10. Stop machine, heat medium water pump stop running. Depressing the white manual lever lightly and then pulling the lever out, pushing the while manual lever down to bottom position, and then "A" port open, "B" port is closed.
11. Stop the filling pump and clean the particle filter.
12. Start the filling pump, open the valve between the service connections.
13. Close the valve on the service connection's return line. Now pressurise the system (to max 3 bar) with the filling pump.
14. Close the valve (AV2) on the service connection.
15. Stop the filling pump.
16. Select the auto operating mode using the operating mode button.



AVT	Draining	SF	Particle filter
SAV	Safety valve	BK	Rock collector
CW	Cold water	JK	Soil collector
NK	Level vessel	HW	Hot water

Internal air vent valve, brine



Inspection

Adjust the brine and the heating medium pump

1). Read the brine temperatures on the panel. The difference between these two temperatures should be 2—5 °C when the system has come into balance. Adjust the flow with the knob on the brine pump (32). A high difference indicates a low brine flow. A low difference indicates a high brine flow.

The pump is adjustable to adjust brine flow.

2). Check the flow temperature and the return return temperature on the panel. The difference between these two temperatures, with floating condensing, should be 5 — 10 °C when the house is being heated without additional heat. Adjust the flow with the knob on the heating medium pump (37). A high difference could depend on a low heat medium flow. A low difference indicates a high heat medium flow.

The pump is adjustable to adjust heat medium flow.

NOTE!

The compressor must not be forced to start with periods shorter that 1 start per 15 minutes.

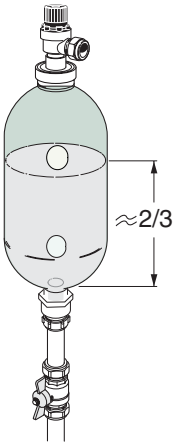
Readjusting, heat medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the entire system requires further venting. When the system has stabilised (correct pressure and all the air removed) the heating controls can be set at the required values.

Readjusting, collector side

Check the fluid level in the level vessel (85). If the level has dropped, close the valve under the vessel. You can then fill through the connection at the top of the vessel. After filling, open the valve again.

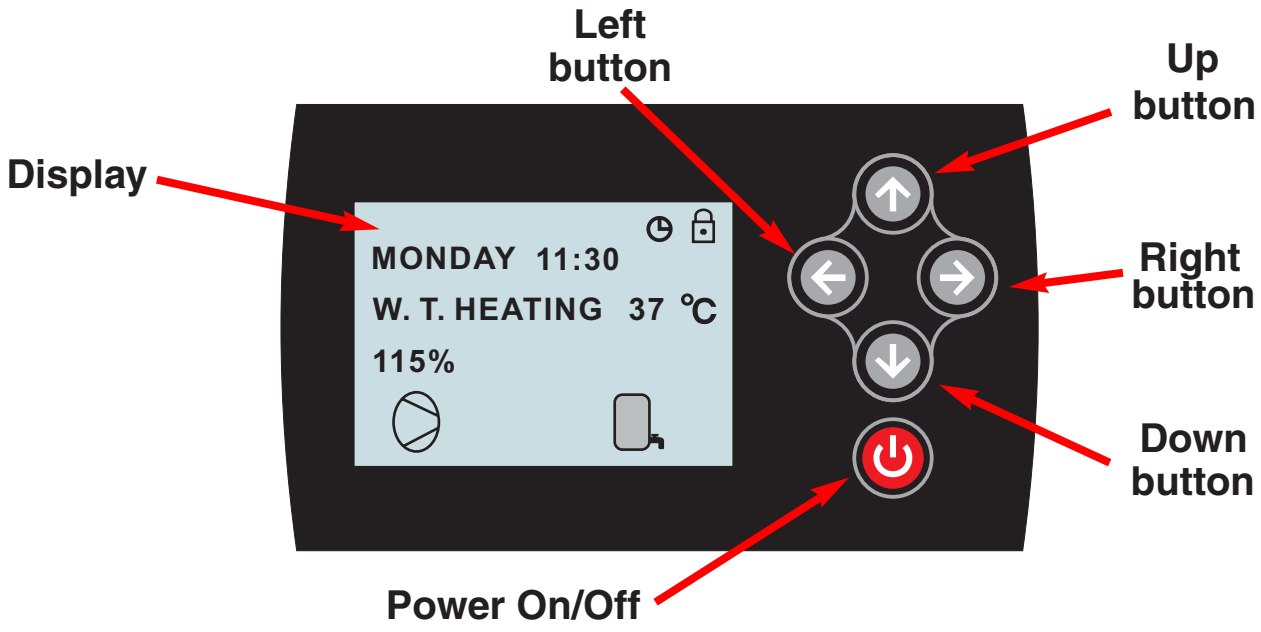
To raise the pressure, close the valve on the incoming main pipe when the brine pump (KBP) is running and the level vessel (NK) is open, so that water is drawn in from the vessel.



Emptying the water heater

The siphon principle is used to empty the water heater. This can be done either via the drain valve on the incoming cold water pipe or by inserting a hose into the cold water connection.

Layout



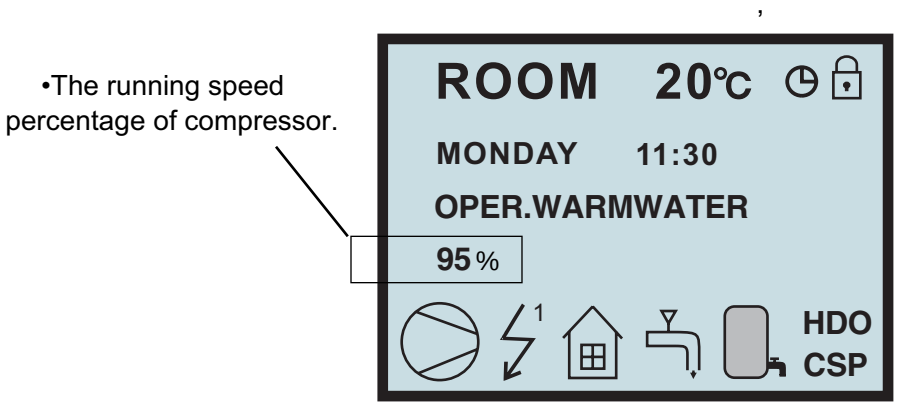
- One button pointing upwards marked with a up arrow
- One button pointing downwards marked with a down arrow
- One button pointing to the right marked with a right arrow
- One button pointing to the left marked with a left arrow
- One button pointing to the ON/OFF

Explanation

Control Panel

The control panel of BWB-SS DC features a graphic display five control buttons .

Beside the control panel you will find the User's Manual, a short description of how to increase and reduce room temperature, and a label with name and phone number of dealer.



Graphic display

17 Control panel

Functions

The control computer is operated with the help of a user friendly menu system that is displayed on the control panel. There is a main menu and several sub-menus accessible from the main menu. The menus are described in detail further down.
To be able to select the desired menu and increase or reduce preset values, you will use the five buttons.

The right-hand button on the control panel is used to open the desired menu.
The left-hand button is used to return to the previous menu.
The up and down buttons are used to navigate between the parameters of a menu.
A cursor (arrow) on the left-hand side of the display indicates which menu can be opened.
The up and down buttons are also used if you wish to increase or reduce a preset value.

Symbols

For you to know at a glance the actual operating mode of the heat pump, one of the following symbols will be shown in the lower part of the display depending on which part of the unit is working:

The heat pump is running.

Warm water is being produced.

The auxiliary heater is activated.
The figure next to the symbol indicates capacity step.

Indicates the status of warm water production. If the symbol is empty, warm water temperature is under the setting temperature.

There is a room heating demand.

If the symbol is full, warm water temperature reached to the setting temperature

HDO

When this symbol appears, the heat pump is not running due to external signal stop it; heat pump will restore running as soon as signal input again

CSP

When this symbol appears, the compressor was not running due to high pressure of refrigerant system; the compressor will be stopped as soon as water temperature over 50 °C and refrigerant system pressure over 4.0MPA, electrical heater will start as supplementary; compressor will restores as soon as water temperature less than 50 °C and refrigerant pressure get right.

NOTICE

During heat pump running, if the water tank symbol twinkles once in every second, it means water tank temperature is too low and it is in antifreezing protection. At the time warm water heating will forcibly start until water temperature get to 20 ℃, then go back to previous running mode.

General information

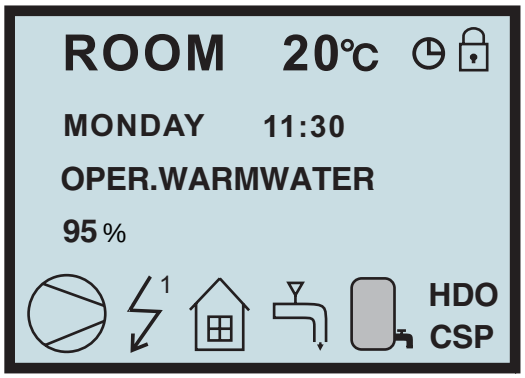
Menu Navigation

The right-hand button on the control panel is used to open the desired menu.
The left-hand button is used to return to the previous menu.
The up and down buttons are used to navigate between the parameters of a menu.
A cursor (arrow) on the left-hand side of the display indicates which menu can be opened.
The up and down buttons are also used if you wish to increase or reduce a preset value.

Display of current operating mode

During normal operation, the following information will be displayed:

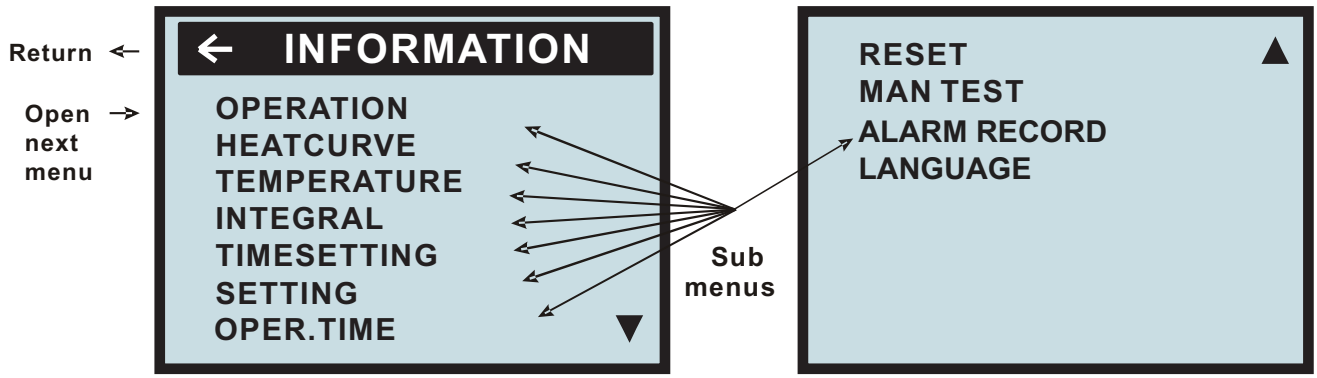
- Desired (preset) room temperature
- Date / time / timer
- Whether there is a heating demand or not. If there is, there will also be symbols telling which heat source is working, heat pump or auxiliary heater or both (see ”Symbols”).
- Which operating mode has been selected.



When display at the interface, press button Right for 5 seconds for locking the display (will show a symbol of lock.) All buttons are not available after lock is active, until press button Right for 5 seconds to open the lock; if the lock is active and then power supply cut off, the lock will be open after power supply resume.

Main Menu INFORMATION

To open the main menu INFORMATION, press the right- or left-hand button once.



To select the desired sub-menu use the up or down button.

Open the menu by pressing the right-hand button once.

To return to the main menu, press the left-hand button once.

OPERATION

Running mode: Water tank heating, Room heating, Room heating 1, Room heating 2, Auto;

HEATCRVE

The setting of this submenu will affect the room temperature; CURVE is program that adjusts feed water temperature according outdoor ambient temperature, factory setting is ambient temperature 0℃ as feed water temperature 40℃, that is CURVE =40; the value of CURVE is adjustable from 22℃ to 56℃. How to change the slope—two points decide one beeline, point one is (0,40), the other point could be (18,24), the point (18,24) is not changing when changing the slope, because factory setting is that heat pump stops when outdoor ambient temperature is 18℃, so the feed water temperature should be 24℃.

TEMPERATURE

Temperature items setting.

Menus

INTEGRAL
Integral is a program to set the startup time and distance between compressor and electrical heater, to set stop conditions of compressor and electrical heater. This program is depends on the "feed water temperature degeneratiaon" and Time.

COMPRESSOR A -60 (0)

ADD1 500 (-60)

TIMESETTING
To set Time, year, month, date, and week; electrical heater timing, water tank heating timing, whole unit timing.

SETTING
To set Emergency mode 1, Emergency mode 2, night mode, day mode, start conditions of electrical heater.

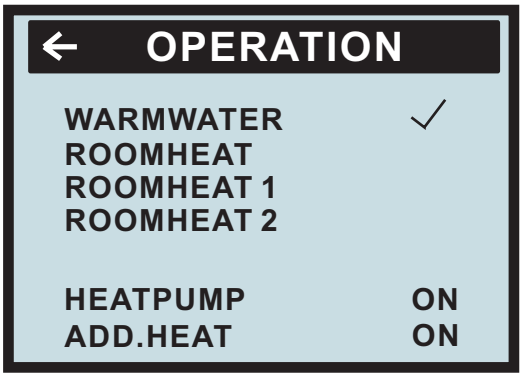
OPER.TIME
To calculate how much time have been running by compressor, electrical heater.

RESET
Return to factory settings: press button Right to go back all factory settings.

MAN TEST
Engineer testing

ALARM RECORD
To record 8 alarm histories recently; the newest alarm message will be seen in the first line. Press the right button to check alarm history.

Sub-Menu OPERATION



WARMWATER :
Water tank heating(warmwater) mode: when enter this mode(under this mode has a program call ‘compressor restart determined by water temperature degeneration’), heat pump only heat the water tank. The unit stops running as soon as water tank’s temperature gets to setting temperature, then compressor restart determined by water tank temperature degeneration(CMPDIFTEMP)

ROOMHEAT :
Room heating mode: when enter this mode, heat pump only heat the room. In this mode heat pump runs according to the relationship between Time and Feed water temperature, under a constant ambient temperature, operator can change the feed water temperature through slope of the CURVE.

ROOMHEAT1 :
Room heating mode 1: when enter this mode, heat pump only heat the room. In this mode heat pump runs according to Feed water temperature, operator can set the feed water temperature directly (adjustable from 20 to 65℃, factory setting is 45℃)

ROOMHEAT2 :
Room heating mode 2: when enter this mode, heat pump only heat the room. In this mode heat pump runs according to room air temperature, operator can set the room air temperature directly (adjustable from 16 to 31℃, factory setting is 27℃)

WARMWATER+ROOMHEAT (ROOMHEAT1 or ROOMHEAT2) :
Auto mode: select (√) water tank heating and room heating at the same time, enter Auto mode. After enter this mode, water tank heating has the priority (compressor restart when in water tank heating must follow program ‘CMPDIF TEMP’). When water tank get to setting temperature, three -way valve will change its direction to room heatingorcoolingautomatically. If the water tank temperature decrease, three-way valve’s direction will go back to water tank heating.

Menus

ADD.HEAT (ON or OFF)

ON：select ON, electrical heater is running normally.

OFF：select OFF, only switch off electrical heater，the others are running normally.

If you wish to change operating mode:

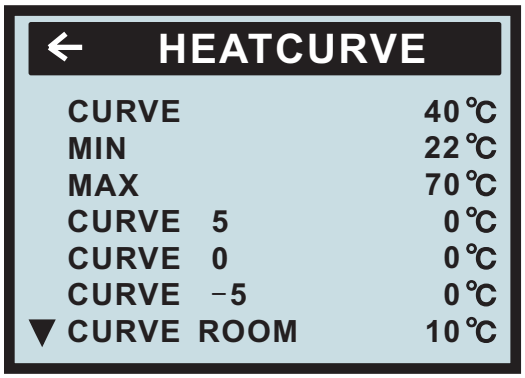
a. Open the main menu INFORMATION by pressing the right-hand button once. You will find the cursor at the sub-menu named OPERATION.

b. Open the OPERATION menu by pressing the right-hand button once. You will find the cursor at the previously selected operating mode.

c. Select the desired mode by pressing either the ”up” or ”down” button.
Return to the main menu by pressing the left-hand button twice.

Sub-Menu HEAT CURVE

This menu is used for making adjustments that affect the room temperature. For more information, please refer to ”Adjustments to be made regularly” on page 22.

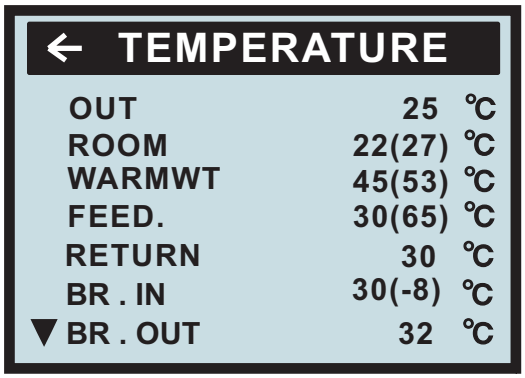


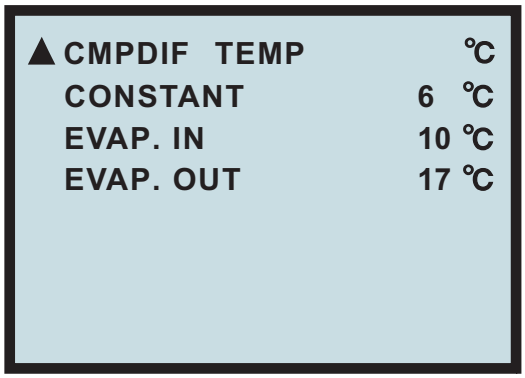
Menu Text	Description	Adjustable by
CURVE	The value entered shows the temperature of the water to be distributed to the radiators (feed water temperature) when the outside air temperature is 0°C.	used(see ”Adjustment of CURVE value” on p22.)
MIN	Adjustment of value for lowest feed water temperature allowed.	used(see ”Adjustment of MIN & MAX value” on p26.)
MAX	Adjustment of value for highest feed water temperature allowed.	used(see ”Adjustment of MIN & MAX value” on p26.)
CURVE 5	Adjustment of room temperature when the outside air temperature is +5°C.	used(see ”Adjustment of CURVE value” on p25.)
CURVE 0	Adjustment of room temperature when the outside air temperature is 0°C.	used(see ”Adjustment of CURVE value” on p25.)
CURVE - 5	Adjustment of room temperature when the outside air temperature is -5°C.	used(see ”Adjustment of CURVE value” on P25.)
CURVE ROOM	The translation of heat curve origin: change Room value also can change Curve valve, in this way, the Curve’s slope is not change; if change the Curve directly, its slope will change; to change every Room value, the translation of Curve is1℃.	used(see ”Adjustment of CURVE value” on p23.)

Menus

Sub-Menu TEMPERATURE

This menu shows the different temperatures of the heating system. All temperature changes registered over the last 60 minutes are stored in the control system and can be viewed in the shape of graphs.





OUT： Display outdoor ambient temperature.

WARMWT： water tank temperature, the first value is water tank real temperature, the second value in ‘ ( )’ is water tank setting temperature; the setting temperature is adjustable from 20 ℃ to 62℃, factory setting is 45℃.(compressor restart must follow the program ‘CMPDIF TEMP’)

ROOM： Display room air temperature.

RETURN： Display real return water temperature.

FEED： 1.the first value is real feed water temperature, the second value in ‘( )’ is feed water setting temperature in ROOMHEAT MODE, it is adjusted by slope of Curve according to outdoor ambient temperature. Factory setting is that feed water temperature is 40℃ when outdoor ambient temperature is 0℃, that is to say Curve is 40, the value of Curve is adjust from 22℃ to 56℃. This setting is only available for Room heating, not for water tank heating.

2. under ROOMHEAT 1 mode, FEED setting can be adjust directly from 20 to 65℃, factory setting is 45℃; this setting is only available for room heating, not for water tank heating.

BR .IN: Display the temperature of Brine system when entering the heat pump;it is adjustable from 15 to -12℃ , factory setting is 0℃.

BR. OUT: Display the temperature of Brine system when leaving the heat pump.

CMPDIF TEMP: compressor restart determined by water temperature degeneratiaon of water tank. This setting is only for water tank heating, it is adjustable from 3 to 15 ℃, and factory setting is 5℃.

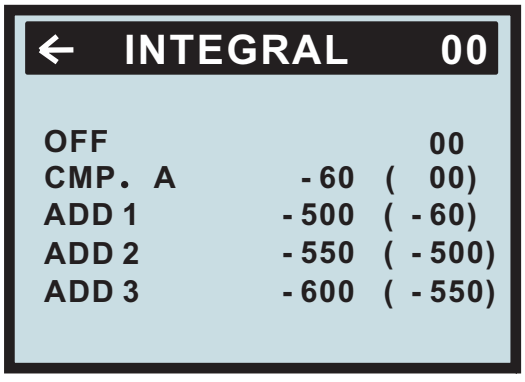
During heat pump's running, if the actual brine inlet temperature lowers than brine inlet setting water temperature, heat pump stop running; during heat pump pause, the water pump will stop 5 minutes after it runs 1 minute, this is for absorb the heat for brine water and update brine water temperature information; heat pump will restore running when actual brine inlet temperature higher than setting temperature 2.5℃.

When at item WARMWT or RETURN or FEED, orBRINEINorBRINEOUT, press button Right 5 seconds willdisplay the information as follow kind of chart, to check how the temperature is going in one hour.

EVAP .IN: Temperature is the evaporator inlet refrigerant temperature data, for engineer use only.

EVAP .OUT: Temperature is the evaporator outlet refrigerant temperature data, for engineer use only.

Sub-Menu INTEGRAL



Menus

Integral (DM) is a program to set the startup time and distance between compressor and electrical heater according to heat demand and heat output, to set stop conditions of compressor and electrical heater. This program is depends on the "feed water temperature degeneratiaon" and Time. To enter this menu operator can change the factory setting:

Menu Text	Description	Adjustable by
OFF	When the value (testing) reaches the value setting by user, the system will be closed.	USER
CMP.A	When the value (testing) reaches the value setting by user, the compressor will be start-up. And the value (testing) under the value (setting), the compressor will be closed.	USER
ADD1	When the value (testing) reaches the value setting by user, the ADD 1 will be start-up. And the value (testing) under the value (setting), the ADD1 will be closed.	USER
ADD2	When the value (testing) reaches the value setting by user, the ADD2will be start-up. And the value (testing) under the value (setting), the ADD2 will be closed.	USER
ADD3 *	When the value (testing) reaches the value setting by user, the ADD 3 will be start-up. And the value (testing) under the value (setting), the ADD3 will be closed.	USER

Degree Minute's(DM) instruction

Degree Minute = The corresponding value of temperature difference between the Feed water and the Desired water X Running time (through **integral** to change; every minute for a cumulative)

Temperature difference between the feed water and the desired water (℃)	**The corresponding value**
-31 ~ -40	-40
-21 ~ -30	-30
-11 ~ -20	-20
-1 ~ -10	-10
1 ~ 10	10
11 ~ 20	20
21 ~ 30	30
31 ~ 40	40

For example:
(Under desired temperature)
Feed water temperature decrease 1℃ (under desired temperature) in 1 minutes,
Degree Minute=-10 X 1= -10;
Feed water temperature continue decrease 2℃(under desired temperature) in another 1 minutes,
Degree Minute=-10 X 1 + (-10) = -20;
Feed water temperature continue decrease 3℃(under desired temperature) in another 1 minutes,
Degree Minute=-10 X 1 + (-20) = -30;
Feed water temperature continue decrease 4℃(under desired temperature) in another 1 minutes,
Degree Minute=-10 X 1 + (-30) = -40;
……

Degree Minute's(DM) instruction

Before the Degree Minute reach - 60 (adjustable) ,the compressor is off, but when the Degree Minute reach - 60 (adjustable) ,the compressor automatic start, and the flow temperature will begin increase.

(Higher than desired temperature) when the actual water supply temperature reach / higher than the desired temperature, the DM will be changed.

For example : the DM was cumulated to -160 in this time.

1 minutes later when the Feed water temperature higher than desired temperature for 1℃.

10X1=10 , Degree Minute= -150;

Another 1 minutes later when the Feed water temperature higher than desired temperature for 2℃. 10X1=10, Degree Minute= -140;

Another 1 minutes later when the Feed water temperature higher than desired temperature for 3℃. 10X1=10, Degree Minute= -130;

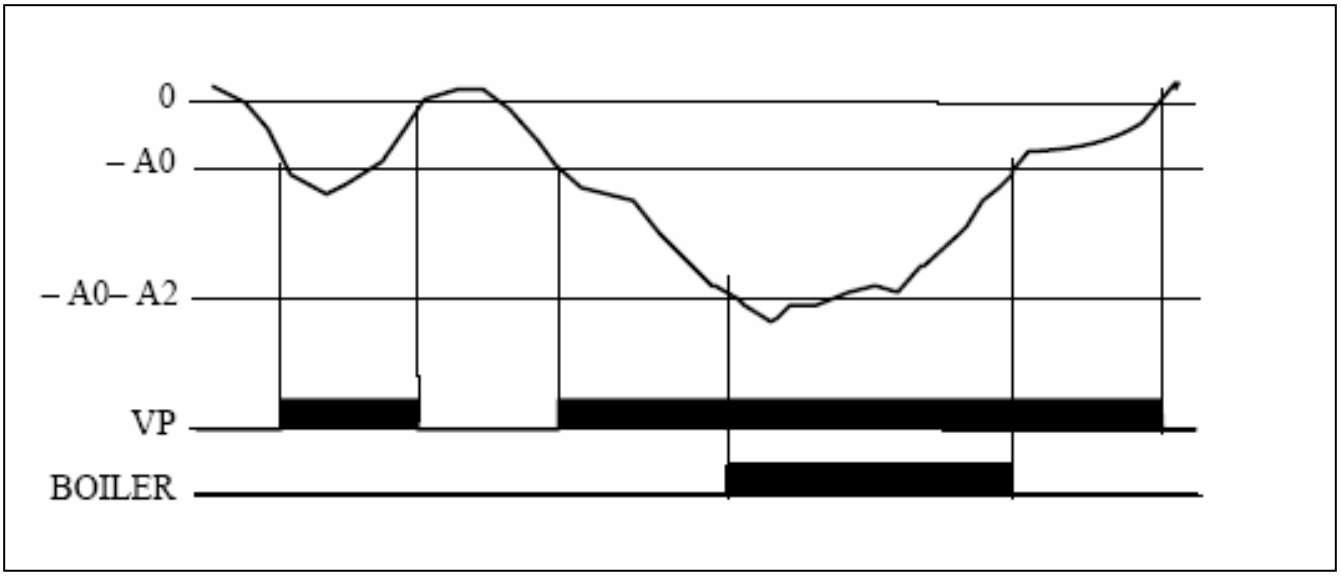
Another 1 minutes later when the Feed water temperature higher than desired temperature for 4℃. 10X1=10, Degree Minute= -120;

……

Compressor off when Degree Minute reach 0 (adjustable) .

The relationship between compressor and DM

The relationship between compressor (on and off) and DM,the relationship between heater(on and off) and DM.



The above chart is describing that running of compressor and electrical heater depend on Integral

The compressor's DM is -60 start, 0 is off, A0=-60 startup.

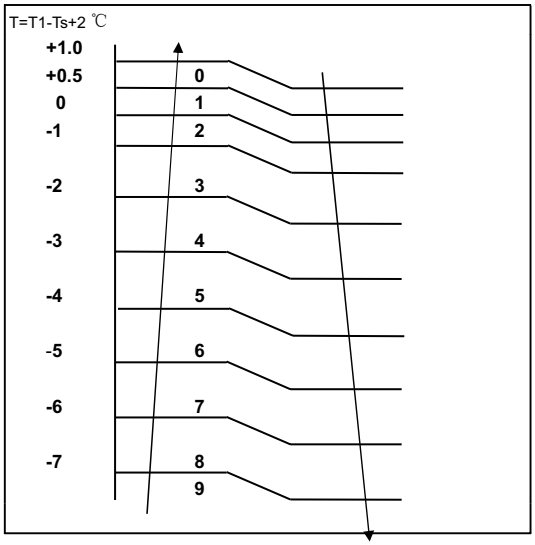
Electrical heater 1 's DM is -500 start,when the feed water temperature reach the setting value the electrical heater is off, A0+A2=-60-440=-500 start up.Electrical heater 2 / 3 is the same principle.

The constant temperature function is only available in Room heating, but not in water tank heating.

Constant temperature function has two kinds: Integral (DM) and Constant room temperature

1. The constant area diagram: T1, room return water temperature, Ts, room air setting temperature or feed water temperature.

The relationship between compressor and DM



After compressor start running, when 'setting return water temperature – actual return water temperature ≤ constant temperature setting, and the electrical heater does not start, then enter constant temperature control The temperature and its frequency during constant temperature program. Recorded by the above chart △T=T1-Ts+2℃, △T has 10 areas, from 0 to 9, the rule of constant temperature program's frequency is follow:

a) when △T is changing
   i) When △T is increasing, the frequency increase 1 to run
   ii) When △T is decreasing, the frequency decrease 1 to run

b) when △T stay at a area as 3 minutes, the rules as follow:

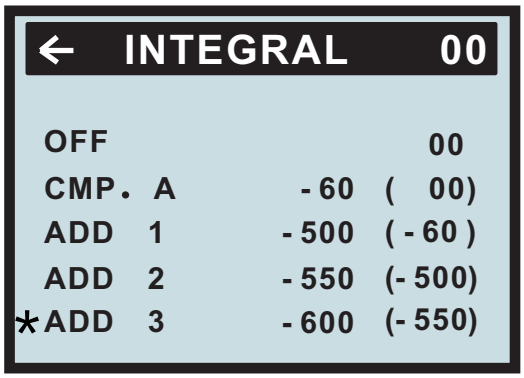
4 ～ 8: the present frequency increase 1(keep 10 min to increase 1)，until get the maximum frequency.

3: frequency is unchanged

0～2: The present frequency decrease 1 to run, until the frequency is get to F1

2．Constant temperature of Integral：

The constant area is from 00 to -600 (DM), It is running as integral changing.



1： When integral is coming to negative side, the frequency is increase 1 to run; the frequency will unchangeable until get to maximum integral;

2： When integral is coming to positive side, the frequency is decrease 1 to run; the frequency will unchangeable until get to minimum integral.

3： Room air constant temperature

a） When △T is increasing, the frequency increase 1 to run; △T will unchangeable until frequency is get to maximum.

b) When △T is decreasing, the frequency is decrease 1 to run. If the present frequency is F1, the frequency is unchangeable even if △T decrease.

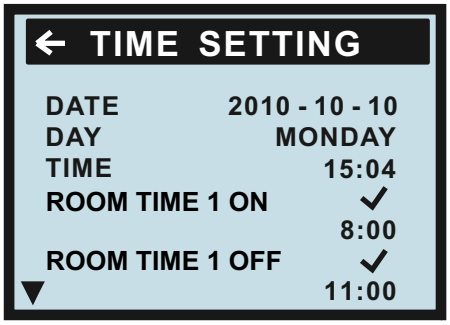
Menus

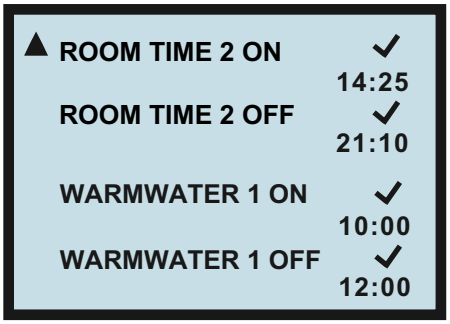
Sub-Menu TIMESETTING

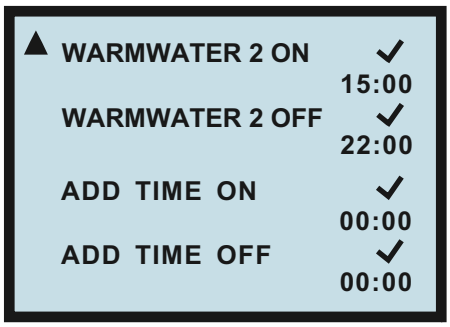
How to enter the Sub-Menu TIMESETTING:

You need to choose the " TIMESETTING" on the main menu (INFORMATION).

Press the right button. Then " TIMESETTING" menu can be seen.







TIMESETTING： use button Up and down to select each item.

DATE
To display year, month, date.

DAY
TO display day of week.

TIME
To display time, or adjust time.

ROOM TIME 1 ON
When you choose the symbol '√', the Auto start function of Room heating is active. Select '×'to cancel this function. If this function is active the heat pump will start heating room at the time of your choosing.

ROOM TIME 1 OFF
When you choose the symbol '√', the Auto stop function of Room heating is active. Select '×'to cancel this function. If this function is active the heat pump will stop heating room at the time of your choosing.

ROOM TIME 2 ON
The second timer for Room heating; function the same with **ROOM TIME 1 ON**

ROOM TIME 2 OFF
The second timer for Room heating; function the same with **ROOM TIME 1 OFF**

WARMWATER TIME 1 ON
When you choose the symbol '√', the Auto start function of water tank heating is active. Select '×'to cancel this function. If this function is active the heat pump will start heating water tank at the time of your choosing.

WARMWATER TIME 1 OFF
When you choose the symbol '√', the Auto stop function of water tank heating is active. Select '×'to cancel this function. If this function is active the heat pump will stop heating water tank at the time of your choosing.

WARMWATER TIME 2 ON
The second timer for water tank heating; function the same with **WARMWATER TIME 1 ON**

WARMWATER TIME 2 OFF
The second timer for water tank heating; function the same with **WARMWATER TIME 1 OFF**

More information for above timers:

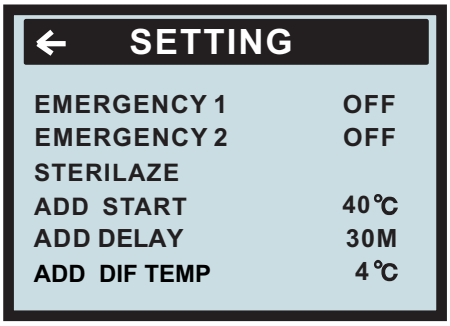
After you set any of the above timers, so-called timer mode; under timer mode the heat pump will only runs the heating mode according to the timer which already be set; for example, to set the WARMWATER heating timer only, the heat pump will only do the water tank heating; if you need hot water and room heating please set ROOM timer and WARMWATER timer at the same time.

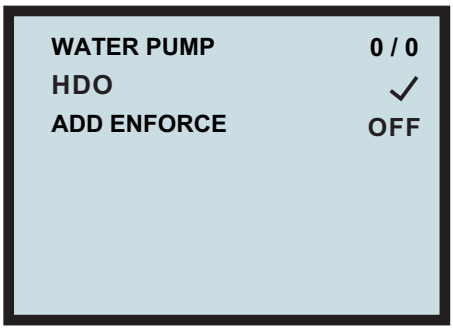
If the time ON and OFF be set at the same number such as ON 8:00, OFF 8:00, the timer function will be no effective.

ADD TIME ON
When you choose the symbol '√', the Auto start function of Supplementary electrical heater is active. Select '×'to cancel this function. If this function is active the heat pump will start heating by Supplementary electrical heater at the time of your choosing.

Menus

Sub-Menu SETTING



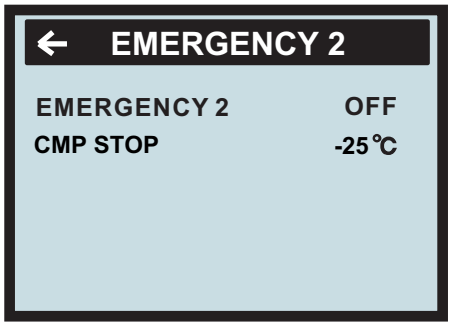


EMERGENCY1 (ON or OFF)

Emergency mode 1（emergency 1）:（ON or OFF），factory setting is OFF(after select emergency mode, the unit will continuously execute the same objective (room heating only, water tank heating only, or auto)

When select ON, compressor will be switch off, only electrical heater, water pump or other temperature protection are available. When in water tank heating, the electrical heater will instead of compressor; when in room heating mode, the electrical heater will runs depends on Integral; when in room heating mode 1, the electrical heater will runs depends on Integral; when in room heating mode 2, the electrical heater automatically starts, unless operator off the electrical heater.

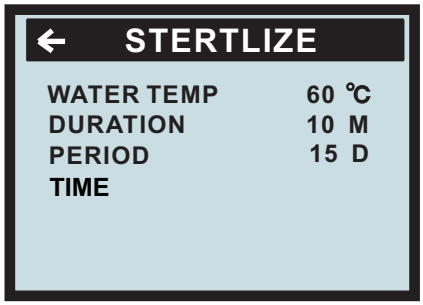
EMERGENCY2(ON or OFF)



Emergency mode 2（ emergency 2）:（ON or OFF），factory setting is OFF: (after select emergency mode, the unit will continuously execute the same objective (room heating only, water tank heating only, or auto)

When select this mode, compressor will stop determined by outdoor ambient temperature, the temperature setting is from 0 to -50 degree adjustable, factory setting is -25 degree, only electrical heater, water pump or other temperature protection are available. When in water tank heating, the electrical heater will instead of compressor; when in room heating mode, the electrical heater will runs depends on Integral; when in room heating mode 1, the electrical heater will runs depends on Integral; when in room heating mode 2, the electrical heater automatically starts, unless operator off the electrical heater.

STERILIZE: Sterilize water temperature:（60℃--90℃ adjustable）default is 60℃
Sterilize duration :（10—90minutes）default is10 minutes
Sterilize period :（7----99days）default is 15 days Time : default is 10:00 - 14:00



NOTE : The sterilize action only will be actives during the select time period of the day.

If the water tank's temperature always less than 60℃ (default) and last 360 hours(period), the heat pump will start the sterilize function (the electrical heater start as soon as water get to 50℃), until water temperature get to 60℃(default) and last 10 minutes(default); or if 3 hours later the water temperature still can not reach 60℃, the sterilize function will exit.

Menus

ADD START : (10 to 65 degree adjustable , factory setting is 40 degree)

Electrical heater start water temperature, it is adjustable from 10 - 65°C, factory setting is 40°C, this means when compressor heat the water temperature over 40°C, then allow the electrical heater to start, this setting is for energy-saving and water tank heating (WARMWATER) only.

ADD DELAY: (3 to 10Min adjustable ,factory setting is 10M)

Time delay of electrical heater starting: from 3 to 30 minutes adjustable, factory setting is 10 minutes. For example, since compressor has been running 15 minutes, when 10 minutes （factory setting）later the return water temperature remain or decrease, the electrical heater will start automatically.

ADDDIF TEMP

Additional electrical heater restart determined by water temperature degeneration: it is adjustable from 1 to 10 degree (factory setting is 4 degree); the electrical heater will stop when the water get to setting temperature, then restarts as soon as the water temperature decrease 4 degree (factory setting)

OUTADD.HEAT ON (OFF)

To control outdoor unit electrical heater (bottom electrical heater, evaporator heater), factory setting is ON, the heater will start when ambient temperature is less than 0 ˚C, and stop when ambient temperature is more than 2˚C

When the outdoor electrical heater is select OFF, the outdoor heater can not start automatically.

Display : OUT ADD . HEAT OFF

HDO ON (✓)

Choose " ✓ " to activate the function 'External signal controls heat pump to start or stop'; there are two signal connections (NC), when external signal switch on them, the compressor, electrical hearer and motor will stop running (The water pump will keep running if the operation mode is 'Room heating'); After switch off them, the compressor, electrical heater, motor will restart and work as previous setting.

This function is for the countries which electricity has two different prices in high peak and low peak that they can use signal to stop heat pump when in high peak electricity and start the heat pump when in low peak electricity;

Notice: never input electricity directly to HDO terminals!

ADD ENFORCE

This function is only available for WARMWATER(water tank heating);when you select"ON",the ADD (additional electrical heater) will start enforcedly as soon as compressor start, then stop as soon as water reach setting temperature; when you select "OFF",the ADD only start after fulfill two other conditions (ADD START and ADD DELAY).

WATER PUMP

Press button RIGHT once will change from 0/0 to 3/10, press the button again will change to 3/10, press again will change to 3/15, press again will change to 3/20, press again will return to 0/0

0/0 means water pump (for heating) will keep running when house or water tank reach setting temperature in ROOMHEAT 1 and ROOMHEAT2.

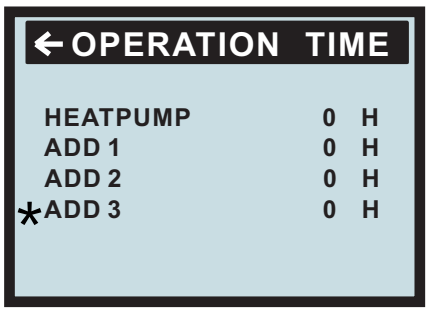
3/10 means that under ROOMHEAT 1 and ROOM HEAT 2; if the setting temperature reach and the compressor stop, the water pumps (for heating) will runs 3 minutes to detect the water temperature, if no need to keep running the water pump will stop 10 minutes, then runs 3 minutes again to see if need to restart compressor and keep water pump running.

3/15 means that under ROOMHEAT 1 and ROOM HEAT 2; if the setting temperature reach and the compressor stop, the water pumps (for heating) will runs 3 minutes to detect the water temperature, if no need to keep running the water pump will stop 15 minutes, then runs 3 minutes again to see if need to restart compressor and keep water pump running.

3/20 means that under ROOMHEAT 1 and ROOM HEAT 2; if the setting temperature reach and the compressor stop, the water pumps (for heating) will runs 3 minutes to detect the water temperature, if no need to keep running the water pump will stop 20 minutes, then runs 3 minutes again to see if need to restart compressor and keep water pump running.

Menus

Sub-Menu OPERATING TIME



Menu Text	Description	Adjustable by
HEATPUMP	Total operating hours of heat pump since installation. Operating time will not be reset to zero.	can not
ADD	Total operating hours of auxiliary heater 1 (3kW) since installation. Operating time will not be reset to zero.	can not
ADD2	Total operating hours of auxiliary heater (6kW) since installation. Operating time will will not be reset to zero.	can not
ADD3 *	Total operating hours of auxiliary heater (9kW) since installation. Operating time will will not be reset to zero.	can not

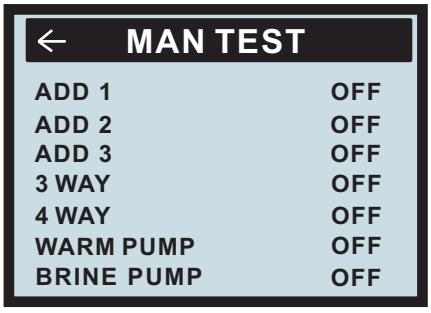
Sub-Menu RESET

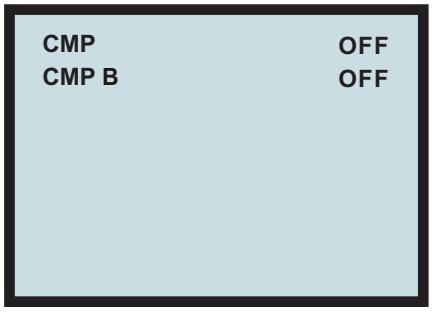
Reset to factory setting value.

Sub-Menu MAN TEST

How to enter the Sub-Menu MAN TEST:

You need to choose the " MAN TEST" on the main menu (INFORMATION) And press the right button for 3 second .





Man test for installation

On sub-menu OPERATION---MAN TEST

ADD1 / 2 / 3	ON or OFF	ADD1 / 2 / 3 (electrical heater 1 / 2 /3)
3 WAY	ON or OFF	3-WAY VALVE
4 WAY	ON or OFF	4-WAY VALVE
WARM PUMP	ON or OFF	WATER PUMP
BRINE PUMP	ON or OFF	BRINE PUMP
CMP	ON or OFF	COMPRESSOR
CMP B	ON or OFF	COMPRESSOR B (invalid)

P.S : the compressor only runs 5 minutes for testing, at that time its frequency is 45Hz.

This menu is for installation engineer, user operation is prohibitive. The testing function will dissolve as soon as the menu is off the interface.

Sub-Menu ALARM RECORD

To record 8 alarm histories recently; the newest alarm message will be seen in the first line. Press the right button to check alarm history.

Adjustments to be made regularly

Sub-Menu LANGUAGE

Language selection :
How to enter the Sub-Menu of LANGUAGE:
You need to choose the "LANGUAGE"on the Main menu (INFORMATION).
Press the right button.
Then "LANGUAGE"menu can be seen.
Use Up and Down button to select the language , and press Right button to confirm.

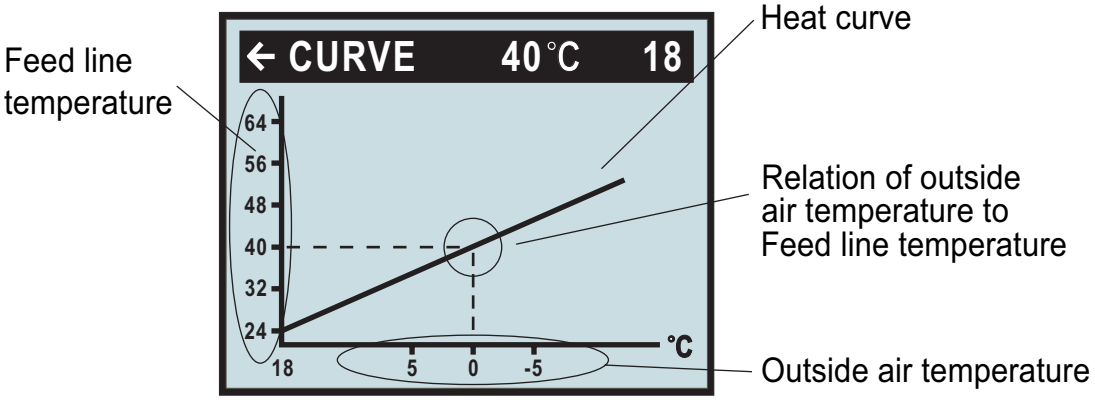
Most settings will be made by the installation contractor in connection with installation. Adjustments to be made regularly by the user are the following:

- Selection of operating mode
- Adjustment of desired room temperature by changing the ROOM value.
- Adjustment of heat curve
- Adjustment of maximum and minimum values for feed line temperature
- Adjustment of the value for HIGH T STOP or LOW T STOP is possible. (Please refer to "Adjustment of HIGH T STOP or LOW T STOP value" on p. 37).

Heat Generation-General

The indoor temperature should be adjusted by changing the heat curve of the installation. The control computer determines the correct temperature of the water to be distributed to the heating system based on the heat curve. The heat curve will be adjusted in connection with installation. It must be adapted later on, however, to obtain a pleasant indoor temperature under any weather condition. A correct heat curve reduces maintenance and saves energy.

The heat curve determines the feed line temperature depending on the outside air temperature. The lower the outside air temperature, the higher the feed line temperature. In other words, the temperature of the water feed to the radiators will increase exponentially as the outside air temperature falls.
If you select CURVE in the sub-menu named HEAT CURVE, a diagram will be displayed. It represents the relation of outside air temperature to feed line temperature. This relation is referred to as heat curve.



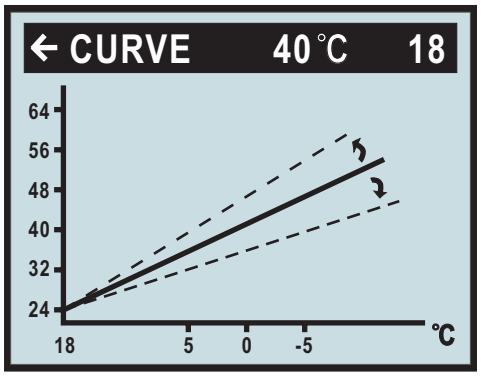
Adjustment of the CURVE value

The heat curve will be adjusted by the CURVE value. This value indicates the feed line temperature to the radiators at 0°C outside temperature. At outside air temperatures lower than 0°C, the water sent to the radiators will be warmer than 40°C.
At outside temperatures higher than 0°C, the water will be colder than 40°C. When you increase the CURVE value, the heat curve will become steeper and when you reduce it, it will become flatter.
This is the most energy and cost efficient way to set the indoor temperature and should therefore be used for long term temperature settings. If you wish to make a temporary change of temperature, you can simply change the ROOM value (see "Adjustment of the ROOM value" on page21).

Adjustments to be made regularly

CURVE is program that adjusts feed water temperature according outdoor ambient temperature, factory setting is ambient temperature 0℃ as feed water temperature 40℃, that is CURVE =40; the value of CURVE is adjustable from 22℃ to 56℃.

How to change the slope—two points decide one beeline, point one is (0,40), the other point could be (18,24), the point (18,24) is not changing when changing the slope, because factory setting is that heat pump stops when outdoor ambient temperature is 18℃, so the feed water temperature should be 24℃.



Change of value for CURVE

If you wish to change the CURVE value:

1.Open the main menu INFORMATION by pressing the right-hand button once. You will find the cursor at the sub-menu named OPERATION

2.Press the ”down” button to move the cursor to the sub-menu called HEAT CURVE.

3.Press the right-hand button once to open the menu. You will find the cursor at the parameter CURVE

4.Open the selected parameter by pressing the right-hand button once.

5.Increase or reduce the preset value using the ”up” or ”down” button. You will see from the diagram how the gradient of CURVE changes.

Press the left-hand button three times to return to the main menu.

Adjustment of ROOM value

As mentioned above, you can also adjust heat curve and indoor temperature by changing the ROOM value. If you use ROOM value to adjust the heat curve, the gradient does not change, i.e. it doesn’t become steeper or flatter. Instead, the whole curve is moved by 1°C for every degree by which the ROOM value is changed.

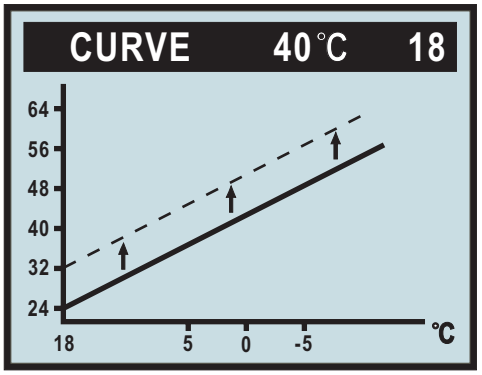
The relation feed line temperature to outside air temperature will not be affected. The feed line temperature will be increased or reduced by the same number of degrees all along the heat curve. See the following diagram.

Adjustment of the ROOM value should only be used for temporary changes of the indoor temperature. For long term settings, the CURVE value should be adjusted as this is the most energy and cost efficient way to set the indoor temperature.

For adjusting the heat curve, please refer to the chapter ”Adjustment of the CURVE value” on page 33.

You need to choose the "room"on the Sub-menu (TEMPERATURE),then press the right button.

Use UP and DOWN button to adjust the "ROOM CURVE". Factory setting of ROOM value is 20°C.



Changing the ROOM value

Adjustments to be made regularly

If you wish to change the ROOM value:

1 Press the ”up” or ”down” button once to open the ROOM value for adjustment.

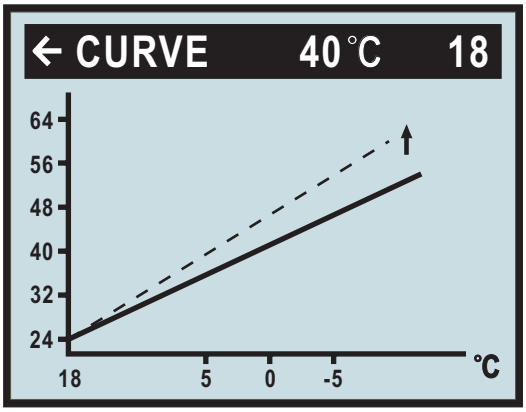
2 Increase or reduce the preset value using the ”up” or ”down” button so that the desired room temperature is reached. Wait for 10 seconds or press the left-hand button once to return to the main menu.

When enter ‘Room heat’ mode, user could control compressor and electrical heater through regulate heat curve or DM (degree minute).
under a certain ambient temperature ,the time start of compressor is determined by degree minute(DM).
Now we are giving two situations to explain.

1. ‘start quickly’ is determined by FEED(heat curve)

Suppose now the feed water temperature is 25℃; regulate the heat curve to let the setting of water temperature to be a higher value such as 55℃,that is FEED25(55). At that time, DM (degree minute) decrease -30 per minute, when the DM reach -60, compressor will start right away.

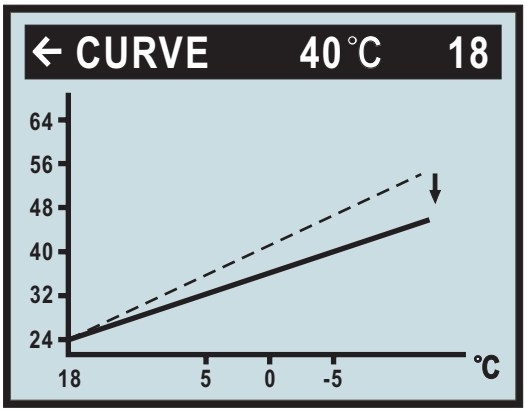
(**Notice:** if the water temperature setting is lower than feed water temperature DM would turn to positive number, and then compressor does not start. Of course, you also can regulate the DM to be near the value for compressor start, such as -20.



turn it up

2. ‘start slowly’ is determined by FEED(heat curve)

Suppose now the feed water temperature is 25℃,if regulate the heat curve to let the setting of water temperature to be a lower value such as 30℃, that is FEED25(30); at that time, the DM would decrease -10 per minute, the time to reach -60 is becoming longer, only after some time, then compressor can start. You also can regulate the DM to be more far away from the value for compressor start, such as (-100).



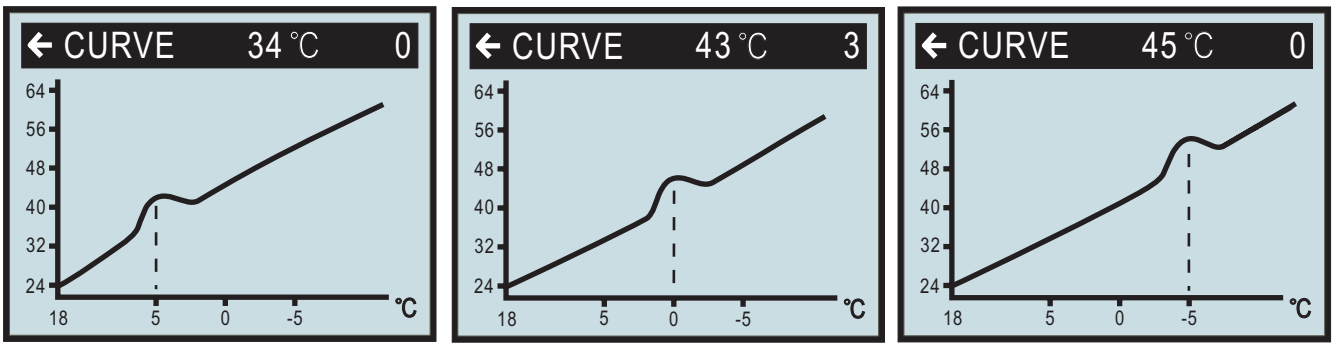
curve is a little flat

When enter room heat mode, it needs customer to regulate the heat curve or DM (degree minute) according to own request.

Adjustments to be made regularly

Adjustment of Part of the Heat Curve

At outdoor temperatures between -5°C and +5°C part of the heat curve may need adjusting if the indoor temperature does not stay at the preset ROOM value. For this reason, the control system includes a function adjusting the curve at three outside temperatures: -5°C, 0°C, +5°C. This function will allow you to increase or reduce the feed line temperature, without affecting the heat curve, at three specific outdoor temperatures. If, for example, the outside temperature is -5°C, the feed line temperature will change gradually in the outdoor temperature range of 0°C to -10°C, maximum adjustment being reached at -5°C. The diagram below shows an adjusted CURVE -5. The point of maximum adjustment is clearly visible. As we have seen, you can choose to adjust the heat curve at three specified out- side air temperatures: -5°C,0°C and +5°C. The feed line temperature can be changed by plus/minus 3 degrees.



When outdoor ambient temperature is 5℃, this setting is available to change the feed water temperature, it is adjustable by operator: heat curve is not change (the slope is no change), but the point near 5℃ (from 0℃ to 10℃), curve can be change step by step; the variable is the biggest at 5℃, it is ±3℃

When outdoor ambient temperature is 0℃,this setting is available to change he feed water temperature, it is adjustable by operator: heat curve is not change (the slope is not change), but the point near 0℃ (from -5℃ to +5℃), curve can be change step by step; the variable is the biggest at 0℃,it is ±3℃.

When outdoor ambient temperature is -5℃,this setting is available to change he feed water temperature, it is adjustable by operator: heat curve is not change (the slope is not change), but the point near -5℃ (from 0℃ to -10℃), curve can be change step by step; the variable is the biggest at 0℃,it is ±3℃.

If you wish to change a specific part of the heat curve:

1. Open the main menu INFORMATION by pressing the right-hand button once. You will find the cursor at the sub- menu OPERATION.
2. Press the ”down” button to move the cursor to the sub-menu HEAT CURVE.
3. Open the selected menu by pressing the right-hand button once. You will find the cursor at the parameter CURVE.
4. Using the ”up” or ”down” button, select either CURVE 5, CURVE 0 or CURVE -5.
5. Open the selected curve by pressing the right-hand button once.
6. Raise or lower the value, using respectively the ”up” or ”down” button. To return to the main menu, press the left- hand button three times.

Adjustments to be made regularly

Adjustment of the MIN and MAX value

The MIN and MAX value is the lowest respectively highest value that is allowed for the supply line temperature. Adjusting the minimum and maximum supply line temperature is particularly important if your home has floor heating. If your house has floor heating and parquet floor, the supply line temperature should not be higher than 45°C. Else the floor might get damaged. If you have floor coils and stone tiles, the MIN value should be 22-25°C in summer when no heating is required to obtain a comfortable floor temperature.

MIN is the minimum setting of feed water temperature; it is adjustable by operator from10 to 30℃, factory setting is 22℃; if the room's floor use ceramic tile, then the setting of MIN can not less than 22℃ (this value can get a comfortable floor temperature); the heat pump will restart as soon as actual feed water temperature less than MIN setting.

MAX is the maximum setting of feed water temperature, it is adjustable by operator from 30 to 70℃, and factory setting is 70℃; if heat pump is using for floor heating, this setting is very important, because at the time the feed water temperature can not higher than 70℃, otherwise could be dangerous; the heat pump will stop as soon as actual feed water temperature more than MAX setting.

If there is a basement to your house, the MIN value should be adjusted to a suitable temperature in summer too, to avoid a humid and chilly basement. In such cases, the value for HEAT STOP needs being adjusted upwards. If you wish to change the MIN or MAX value:

1. Open the main menu INFORMATION by pressing the right- or left-hand button once. You will find the cursor at the sub-menu OPERATION
2. Press the ”down” button to move the cursor to the sub-menu HEAT CURVE
3. Open the selected menu by pressing the right-hand button once. You will find the cursor at the parameter CURVE.
4. Press the ”down” button to move the cursor to MIN.
5. Open the selected parameter by pressing the right-hand button once. The cursor is at MIN
6. Raise or lower the value, using the ”up” and ”down” button respectively.
7. Press the left-hand button three times to return to the main menu.

Repeat the procedure to change the MAX value, replacing MIN by MAX at step 4.

Adjustments to be made regularly

5 Press the ”down” button to move the cursor to HIGH T STOP or LOW T STOP.

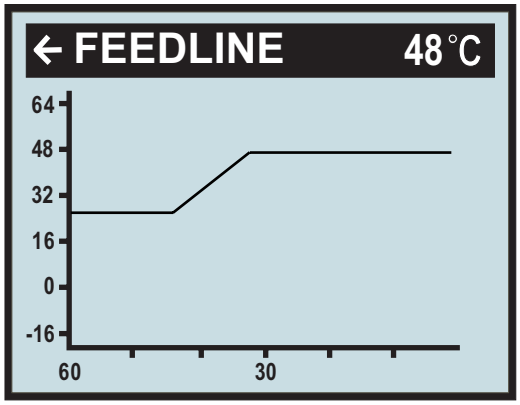
6 Open the selected parameter by pressing the right-hand button once. The cursor moves to HIGH T STOP or LOW T STOP.

7 Raise or lower the value, using respectively the ”up” or ”down” button.

8 Press the left-hand button three times to return to the main menu.

Graph of recent changes in TEMPERATURE

All temperatures registered during the last hour can be viewed in the sub-menu TEMPERATURE in the shape of a graph. This will enable you to monitor changes in the different system temperatures.



There is a graph available for all temperatures, except for the OUT / ROOM temperature,where you can only view the measured value. The integral value that is displayed represents the heating system’s energy balance.

If you wish to check the TEMPERATURE graphs:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once. You will find the cursor at the sub-menu OPERATION.

2 Press the ”down” button to move the cursor to the sub-menu TEMPERATURE

3 Open the menu by pressing the right-hand button once.

4 You will find the cursor at the parameter OUT.

5 Press the ”down” or ”up” button to move the cursor to the desired temperature.

6 Open the selected value by pressing the right-hand button once. A graph will be shown in the display.

7 Move the cursor along the time axis using the ”up” (plus) or the ”down” (minus) button. The exact temperature at the selected point of time appears at the top of the display.

8 Press the left-hand button three times to return to the main menu.

Maximum Return Line Temperature

The maximum return line temperature, i.e. temperature of the water returning from the heating system, should be adapted to each individual installation. The correct temperature value for your system will be entered by your installation contractor in connection with installation and can be adjusted later.

Warm Water Production

The temperature of the water distributed to the water heater is controlled by the regulating pressure switch and cannot be adjusted.

Reading of warm water temperature.

To check the actual warm water temperature on the display:

1 Open the main menu INFORMATION by pressing the right- or left-hand button once.You will find the cursor at the sub-menu OPERATION.

2 Press the ”down” button to move the cursor to the sub-menu called TEMPERATURE.

3 Open the menu by pressing the right-hand button once.

4 Press the ”down” button to move the cursor to the parameter WARMWATER.

5 Open the selected parameter by pressing the right-hand button for 3 seconds.

A graph will be shown of last hour’s warm water temperatures.

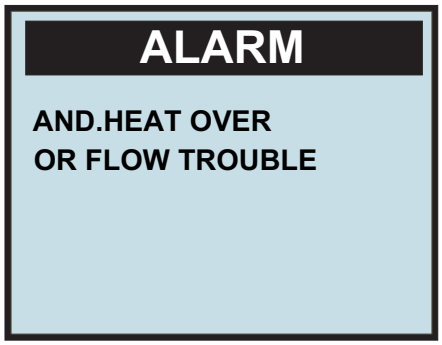
6 Press the left-hand button three times to return to the main menu.

The value displayed next to the parameter WARMWATER is the actual hot water temperature. The value in brackets is the temperature at which warm water production will start. When the actual temperature falls below that value, warm water production starts. The starting value is not adjustable.

Regular Checks

Check of Operating Mode

In the event of an alarm, The background light of LCD will flash and an alarm message will be displayed.



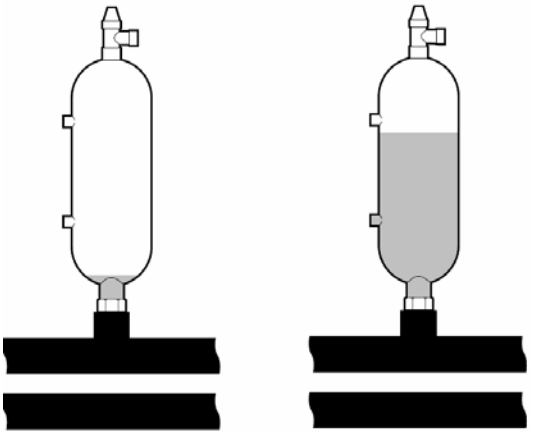
Check the alarm indicator regularly to make sure that the heat pump works properly. You would not always notice if there is something wrong, as the auxiliary heater would start automatically (provided, of course, operating mode AUTO was selected). For more information, please refer to the chapter ALARM MESSAGES on p. 40.

Regular Checks

Checking the Brine Level of the Brine System

The Brine system must be filled with the correct volume of brine. Otherwise the heat pump unit risks being damaged.

Brine system liquid (brine) must be added if the brine level gets so low that it is no longer visible in the expansion vessel.



Level is too low **Level is correct**

first month of operation the brine level might sink a little, which is quite normal. The brine level vary a bit, depending on the temperature of the heat source. Under no circumstances, however, shall level be allowed to sink so much that it is no longer visible in the expansion vessel.
installation contractor for refilling of Brine system liquid.

Checking the Water Level of the Heating System

The pressure of the heating system should be checked once monthly. The pressure, shown on the external pressure gauge, should be 1-1,5 bar. If the value is below 0.8 bar with cold water in the heating system, more water must be added (applies to a closed expansion vessel). To find out where the pressure gauge is located.

You can use ordinary tap water for filling the heating system. In some rare cases the water quality would be unsuitable for this purpose (corrosive or calcareous water). In case of doubt, we would recommend that you call your installation contractor.

Don't use any water treatment additives for the heating system!

Checking the Safety Valves

Both safety valves of the heating system should be checked at least four times a year to prevent lime deposits to clog the mechanism. To find out where the safety valves are located.

The safety valve of the water heater protects the closed heater against positive pressure. It is fitted on the cold water inlet line, its outlet opening facing down-wards. If the safety valve is not checked regularly, the water heater might be damaged. It is quite normal that the safety valve lets out small amounts of water when the water heater is being charged, especially if a lot of warm water was used previously.

To check the safety valves, give the cap a quarter of a turn clockwise until the valve lets out some water through the overflow pipe.

If a safety valve does not work properly, it must be replaced. Check with your installation contractor.

The opening pressure of the safety valve is not adjustable.

In the Event of Leakage

In the event of leakage in the warm water lines between unit and water taps, the shut-off valve on the cold water inlet line should be closed immediately.
Call your installation contractor. In the event of leakage in the system circuit, turn off the heat pump and call your installation contractor immediately.

Alarm Messages

In the event of an alarm message, try to re-start the unit with the safety switch.
If this does not work, try to solve the problem with the help of the table below. Call your installation contractor if you need help. See ”References” on page 39.

Table 3: Alarm Messages

Alarm	Explanation
DISPLAY EEPROM	EEPROM reading failure from display
DISPLAY-TRANSITION COMMUNICATE	The communications failure between display board and transition circuit board
TRANSITION EEPROM	EEPROM reading error from transition circuit board
TRANSITION-MAIN COMMUNICATE	The communications error between transition circuit board and main circuit board
MAIN-MODULE COMMUNICATE	The communications error between main circuit board and module
OUTDOOR TEMP.	Outdoor ambient temperature sensor error
MODULE VOLTAGE OVER	Outdoor module voltage over-low error
IPM MODULE	IPM module error
CMP TOP OVER	Compressor top temperature over
CMP TEMP.	Compressor exhausts temperature sensor error
RETURN TEMP.	Return water temperature sensor error
WARM WATER TEMP.	Water tank temperature sensor error
FEEDLINE TEMP.	Feed water temperature sensor error
ADD HEAT OVER OR FLOW TROUBLE	Water flow error or electrical heater
HIGH PRESS	Pressure over high
LOW PRESS	Pressure over low
ROOM TEMP.	Room air temperature sensor error
WARM WATER TEMP. TOO LOW	The water tank temperature is too low
BRING IN TEMP.	The brine water inlet temperature sensor error
BRING OUT TEMP.	The brine water outlet temperature sensor error

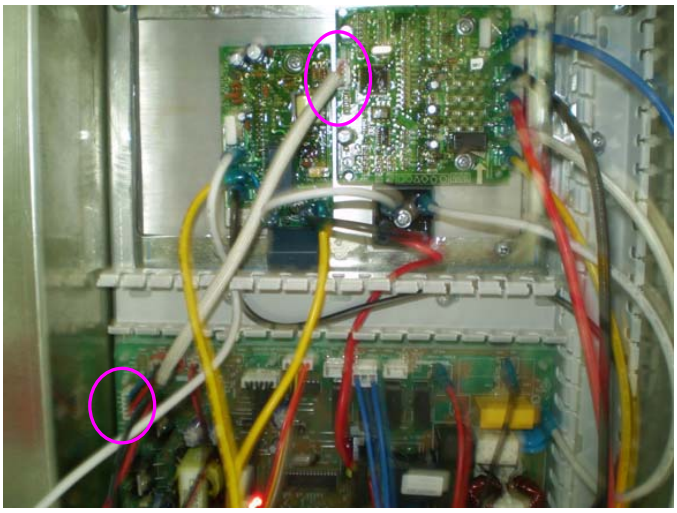
Alarm Messages

The cause of alarm 'IPM MODULE' could be:

1、The communications between Module and outdoor main circuit board is jamming;
2、Module is jamming and can not detect current or compressor;
3、Module can not start compressor;
4、Module's rated 15VDC voltage is not steady
5、Module's current overload；

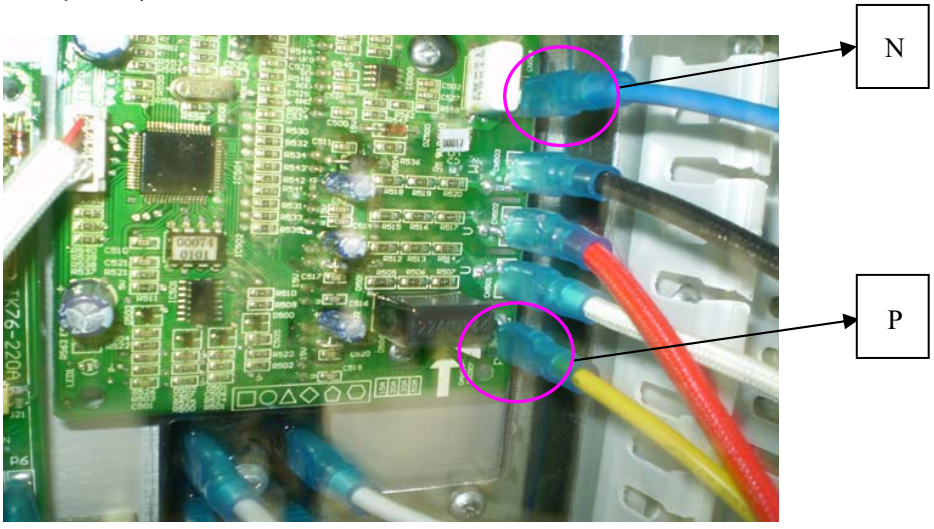
How to do:

1. Please check if all terminals connections among circuit boards were good, whether some of the wire damaged;
2. Please check if the compressor wire connection loose (on the top of compressor);
3. Please measure each two of the connections (on the top of compressor)'s resistance, if the resistance are always the same, means the compressor is fine. there 3 connections on the top of compressor , you need to measure each two 's resistance, for example , let 's say the connections are A, B, C, then you need to measure the resistance of AB, AC, BC;
4. please check wire connection between the outdoor circuit board and module; see the follow picture



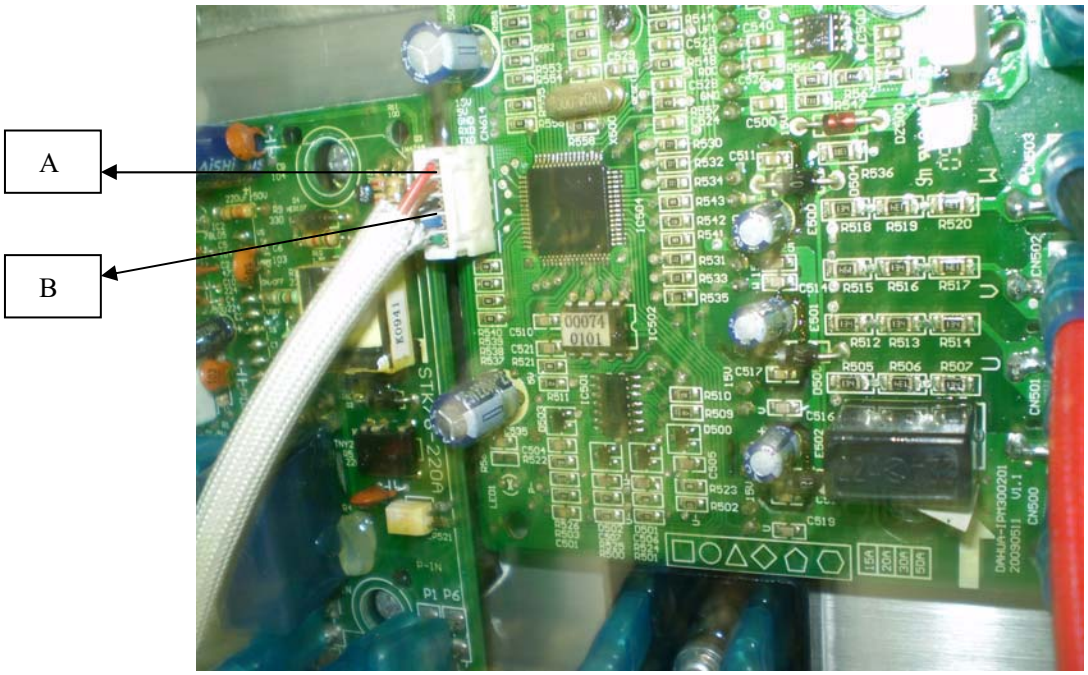
5. Check the DC voltage between terminal P and N if normal, the DC voltage should be:

AGH-70/90WPDC3: 380VDC
AGH-120/150WPDC3 (single phase): 280VDC
AGH-120/150WPDC3 (trinal phase): 540VDC



Alarm Messages

6. check the if DC voltage between A(first wire) and B(third wire) is normal, it should be 13.5V ~16.5V



The cause of alarm 'TRANSITION-MAIN COMMUNICATE' could be:

1. The connection between transition circuit board and main circuit board is wrong;
2. The connection between transition circuit board and main circuit board is not good, such as had creepage;
3. The transition circuit board or main circuit board was damaged.

How to do：

1. Check the connection wire between transition circuit board and main circuit board, their live wires, zero curves was connected correctly;

2. Check the connection wire between transition circuit board and main circuit board, the wire must be less than 20 meters, the terminals must be water- proof;

3. If the connection is fine, then the cause could be the transition circuit board or main circuit board, please check their lights.

The cause of alarm 'MODULE VOLTAGE OVER' could be:

1. Water flow was not enough;
2. One of the sensors got problem;
3. Ambient temperature was too high

How to do:

1. Check if the water flow was not enough;
2. Check all the sensors if they are normal.

Alarm Messages

The cause of alarm 'CMP TOP OVER' could be:

1. Water flow was not enough;
2. Refrigerant was not enough
3. Ambient temperature was too high;

How to do:

1. Check if the water flow was not enough, so that the heat exchange efficiency was not good;
2. Check the refrigerant quantity, and make sure the system has not any leak. ;

The cause of alarm 'ADD OVER OR WATER FLOW TROUBLE ' could be:

1. Water flow is not enough;
2. The connection of brine water flow switch was loose or brine water flow switch was broken;
3. There some air inside the water system, so that the heat exchange area was not enough;
4. The thermostat switch of the electrical heater was broken;

How to do:

1. Always ensure enough water flow; otherwise the brine flow switch can not open;
2. Check the wire connection of brine water flow switch was normal or not, or replace a water flow switch;
3. Before install the system, please vent the air out from the water system, follow manual's instruction;
4. Measure the thermostat switch of electrical heater by ampere meter.

The cause of 'LOW PRESS' could be ：

1. The refrigerant was not enough
2. The connection of low pressure switch was loose, or the switch was broken;
3. The outdoor fan can not run

How to do:

1. Check if there any place leak refrigerant, especially on the connections valves;
2. Check if the wire connection of low pressure switch was ok, or replace a new low pressure switch;
3. Check if the outdoor unit's fan was running, if not, please check if the fan was normal

The cause of 'HIGH PRESS' could be ：

1. The water flow was not enough;
2. The high pressure switch's connection was not good; or the switch was broken;
3. The ambient temperature was too high.

How to do:

1. Always ensure enough water flow; otherwise the flow switch can not open;
2. Check if the wire connection of high pressure switch was ok, or replace a new one;

Alarm Messages

The cause of alarm 'WARM WATER TEMP.' could be:

1. The connection of water tank temperature sensor was loose;
2. The water tank temperature sensor was broken;

How to do:

1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor's resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

The cause of alarm 'FEEDLINE TEMP.' could be:

1. The connection of feed water temperature sensor was loose;
2. The feed water temperature sensor was broken;

How to do:

1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor's resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

The cause of alarm 'RETURN TEMP.' could be:

1. The connection of return water temperature sensor was loose;
2. The return water temperature sensor was broken;

How to do:

1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor's resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

The cause of alarm 'OUTDOOR TEMP.' could be:

1. The connection of outdoor ambient temperature sensor was loose;
2. The outdoor ambient temperature sensor was broken;

How to do:

1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor's resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

Alarm Messages

The cause of alarm ‘CMP TEMP.’ could be:

1. The connection of compressor exhaust air temperature sensor was loose;
2. The compressor exhaust air temperature sensor was broken;

How to do:
1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor’s resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

The cause of alarm ‘BRINE IN TEMP.’ could be:

1. The connection of brine water inlet temperature sensor was loose;
2. The brine water inlet temperature sensor was broken;

How to do:
1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor’s resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

The cause of alarm ‘BRINE OUT TEMP.’ could be:

1. The connection of brine water outlet temperature sensor was loose;
2. The brine water outlet temperature sensor was broken;

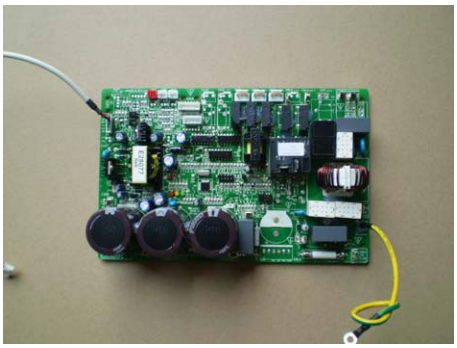
How to do:
1. Find the connection and make sure it is fine;
2. As per resistance table of the sensor, please measure the sensor’s resistance, to judge the sensor was good or bad; replace a new one if the sensor get problem.

Circuit Board Picture For AGH-70 / 90WPDC3

Display

Transition circuit board

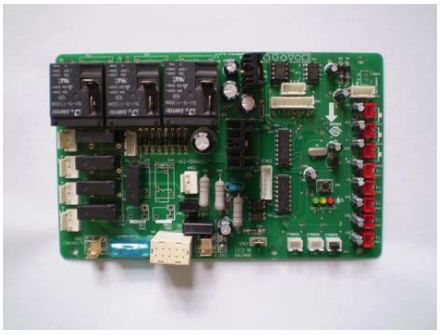
Module



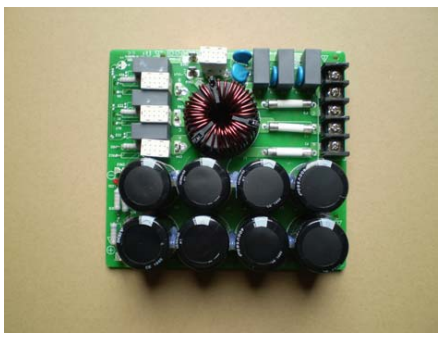
Main circuit board

Circuit Board Picture For AGH-120 / 150WPDC3

Display

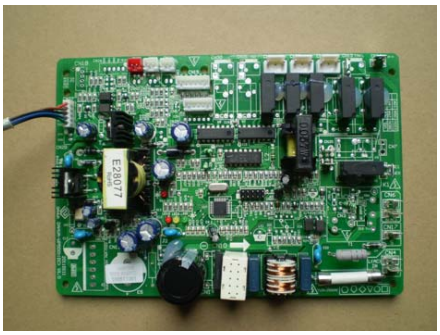


Transition circuit board



Power board

Module



Main circuit board

Sensors resistance table

compressor exhaust temperature sensor resistance

Unit：℃--KΩ （compressor exhaust temperature sensor ）55K											
t ℃	R(KΩ)	AD	t ℃	R(KΩ)	AD	t ℃	R(KΩ)	AD	t ℃	R(KΩ)	AD
-20	542.7	3	**20**	68.66	26	**60**	13.59	95	**100**	3.702	175
-19	511.9	3	**21**	65.62	28	**61**	13.11	97	**101**	3.595	177
-18	483	4	**22**	62.73	29	**62**	12.65	99	**102**	3.492	178
-17	455.9	4	**23**	59.98	30	**63**	12.21	101	**103**	3.392	180
-16	430.5	4	**24**	57.37	31	**64**	11.79	103	**104**	3.296	181
-15	406.7	4	**25**	54.89	32	**65**	11.38	106	**105**	3.203	183
-14	384.3	5	**26**	52.53	34	**66**	10.99	108	**106**	3.113	184
-13	363.3	5	**27**	50.28	35	**67**	10.61	110	**107**	3.025	186
-12	343.6	5	**28**	48.14	36	**68**	10.25	112	**108**	2.941	187
-11	325.1	6	**29**	46.11	38	**69**	9.902	114	**109**	2.86	188
-10	307.7	6	**30**	44.17	39	**70**	9.569	117	**110**	2.781	190
-9	291.3	6	**31**	42.33	40	**71**	9.248	119	**111**	2.704	191
-8	275.9	7	**32**	40.57	42	**72**	8.94	121	**112**	2.63	193
-7	261.4	7	**33**	38.89	43	**73**	8.643	123	**113**	2.559	194
-6	247.8	8	**34**	37.3	45	**74**	8.358	125	**114**	2.489	195
-5	234.9	8	**35**	35.78	47	**75**	8.084	127	**115**	2.422	196
-4	222.8	8	**36**	34.32	48	**76**	7.82	129	**116**	2.357	198
-3	211.4	9	**37**	32.94	50	**77**	7.566	132	**117**	2.294	199
-2	200.7	9	**38**	31.62	52	**78**	7.321	134	**118**	2.233	200
-1	190.5	10	**39**	30.36	53	**79**	7.086	136	**119**	2.174	201
0	180.9	10	**40**	29.15	55	**80**	6.859	138	**120**	2.117	202
1	171.9	11	**41**	28	57	**81**	6.641	140	**121**	2.061	203
2	163.3	12	**42**	26.9	59	**82**	6.43	142	**122**	2.007	204
3	155.2	12	**43**	25.86	60	**83**	6.228	144	**123**	1.955	206
4	147.6	13	**44**	24.85	62	**84**	6.033	146	**124**	1.905	207
5	140.4	13	**45**	23.89	64	**85**	5.844	148	**125**	1.856	208
6	133.5	14	**46**	22.89	66	**86**	5.663	150	**126**	1.808	209
7	127.1	15	**47**	22.1	68	**87**	5.488	152	**127**	1.762	210
8	121	15	**48**	21.26	70	**88**	5.32	154	**128**	1.717	211
9	115.2	16	**49**	20.46	72	**89**	5.157	156	**129**	1.674	211
10	109.8	17	**50**	19.69	74	**90**	5	157	**130**	1.632	212
11	104.6	18	**51**	18.96	76	**91**	4.849	159			256
12	99.69	19	**52**	18.26	78	**92**	4.703	161			256
13	95.05	20	**53**	17.58	80	**93**	4.562	163			256
14	90.66	20	**54**	16.94	82	**94**	4.426	165			256
15	86.49	21	**55**	16.32	84	**95**	4.294	167	**B(25/50)=3950K+-3%**		256
16	82.54	22	**56**	15.73	86	**96**	4.167	168			256
17	78.79	23	**57**	15.16	88	**97**	4.045	170	**R(90 ℃)=5KΩ+-3%**		256
18	75.24	24	**58**	14.62	90	**98**	3.927	172			256
19	71.86	25	**59**	14.09	93	**99**	3.812	173			256

Sensors resistance table 2

water/ambient/pipe sensor resistance

Unit: ℃--KΩ （water/ambient/pipe sensor)											
T	R	AD	T	R	AD	T	R	AD	T	R	AD
-20	115.266	16	20	12.6431	99	60	2.35774	197	100	0.62973	236
-19	108.146	17	21	12.0561	102	61	2.27249	198	101	0.61148	237
-18	101.517	18	22	11.5	105	62	2.19073	200	102	0.59386	237
-17	96.3423	19	23	10.9731	107	63	2.11241	202	103	0.57683	237
-16	89.5865	21	24	10.4736	110	64	2.03732	203	104	0.56038	238
-15	84.219	22	25	10	113	65	1.96532	205	105	0.54448	238
-14	79.311	23	26	9.55074	116	66	1.89627	206	106	0.52912	239
-13	74.536	24	27	9.12445	119	67	1.83003	207	107	0.51426	239
-12	70.1698	26	28	8.71983	122	68	1.76647	209	108	0.49989	240
-11	66.0898	27	29	8.33566	125	69	1.70547	210	109	0.486	240
-10	62.2756	29	30	7.97078	128	70	1.64691	211	110	0.47256	240
-9	58.7079	30	31	7.62411	131	71	1.59068	212	111	0.45957	241
-8	56.3694	31	32	7.29464	133	72	1.53668	214	112	0.44699	241
-7	52.2438	34	33	6.98142	136	73	1.48481	215	113	0.43482	241
-6	49.3161	35	34	6.68355	139	74	1.43498	216	114	0.42304	242
-5	46.5725	37	35	6.40021	142	75	1.38703	217	115	0.41164	242
-4	44	39	36	6.13059	144	76	1.34105	218	116	0.4006	242
-3	41.5878	41	37	5.87359	147	77	1.29078	219	117	0.38991	243
-2	39.8239	42	38	5.62961	150	78	1.25423	220	118	0.37956	243
-1	37.1988	45	39	5.39689	152	79	1.2133	221	119	0.36954	243
0	35.2024	47	40	5.17519	155	80	1.17393	222	120	0.35982	244
1	33.3269	49	41	4.96392	157	81	1.13604	223	121	0.35042	244
2	31.5635	51	42	4.76253	160	82	1.09958	224	122	0.3413	244
3	29.9058	54	43	4.5705	162	83	1.06448	225	123	0.33246	244
4	28.3459	56	44	4.38736	165	84	1.03069	226	124	0.3239	245
5	26.8778	58	45	4.21263	167	85	0.99815	226	125	0.31559	245
6	25.4954	61	46	4.04589	169	86	0.96681	227	126	0.30754	245
7	24.1932	63	47	3.88673	172	87	0.93662	228	127	0.29974	245
8	22.5662	67	48	3.73476	174	88	0.90753	229	128	0.29216	246
9	21.8094	68	49	3.58962	176	89	0.8795	229	129	0.28482	246
10	20.7184	71	50	3.45097	178	90	0.85248	230	130	0.2777	246
11	19.6891	74	51	3.31847	180	91	0.82643	231	131	0.27078	246
12	18.7177	76	52	3.19183	182	92	0.80132	231	132	0.26408	246
13	17.8005	79	53	3.07075	184	93	0.77709	232	133	0.25757	247
14	16.9341	82	54	2.95896	186	94	0.75373	233	134	0.25125	247
15	16.1156	85	55	2.84421	188	95	0.73119	233	135	0.24512	247
16	15.3418	87	56	2.73823	190	96	0.70944	234	136	0.23916	247
17	14.6181	90	57	2.63682	192	97	0.68844	234	137	0.23338	247
18	13.918	93	58	2.53973	193	98	0.66818	235	138	0.22776	247
19	13.2631	96	59	2.44677	195	99	0.64862	236	139	0.22231	248

Terminology and Abbreviations

Evaporate	In the evaporator, energy from the heat source is absorbed by the refrigerant passing through the evaporator. The refrigerant turns into gas. (See "Heat Pump Principle" on p. 4).
INTEGRAL	INTEGRAL is the heat balance of the heating system. Production of heat is regulated acc. to a calculated heat demand value. This value is determined by comparing the actual supply line temperature with its calculated (set point) value. The difference between the two values is multiplied by the time during which the difference is active. The resulting value is referred to as the integral. The integral value is automatically established when heat is being produced. The value can be viewed in the sub-menu TEMPERATURE.
Compressor	The compressor raises temperature and pressure of the the refrigerant (See "Heat Pump Principle" on p.4).
Condenser	In the condenser, the refrigerant releases its heat energy to the heating circuit. (See "Heat Pump Principle" on p.4)
CURVE	The CURVE value will be adjusted on the control panel. The value indicates the temperature of the water distributed to the radiators (supply line temperature) at an outside air temperature of 0°C.
Refrigerant	Circuit in the heat pump filled with refrigerant that by evaporation, compression, and condensation absorbs heat energy from the system circuit and releases it to the Heating circuit.
Radiator	Heating element
Control	The control computer regulates the whole installation. All system settings and computer temperature changes are stored and registered in the computer. Settings are adjusted iav the graphic display on the control panel.
Heating circuit	The heating circuit receives heat energy from the refrigerant circuit and carries it to the water heater or radiator/ floor coil systems. (See further"Heat Pump Principle" on p.4).
Heat curve	The heat curve is the control computer's instrument for determining the required supply line temperature of the heating system. Indoor temperature will be adjusted by adjustment of the CURVE value

Function

When test or repair the machine, the compressor, water cycle pump and outdoor fan motor can be force manual startup.

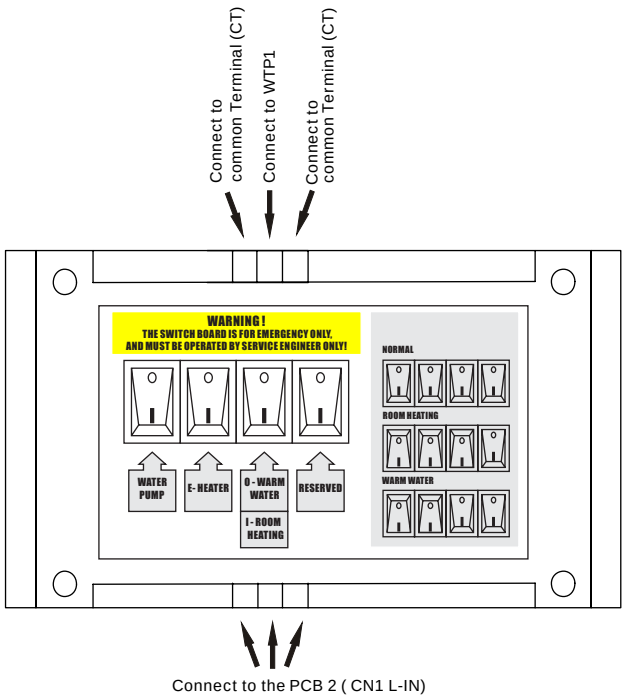
Water Pump : Control the Water Cycle Pump

E-Heater : Control the Electrical Heater 1 and 2

O-Warm Water : Control the 3 way valve turn to the Water Tank Heating side (B side)

I-Room Heating : Control the 3 way valve turn to the Room Heating side (A side)

Reserved : Invalid

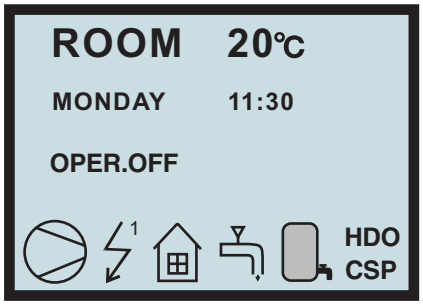

Connect to common Terminal (CT)
Connect to WTP1
Connect to common Terminal (CT)
WARNING !
THE SWITCH BOARD IS FOR EMERGENCY ONLY, AND MUST BE OPERATED BY SERVICE ENGINEER ONLY!
NORMAL
ROOM HEATING
WARM WATER
WATER PUMP
E- HEATER
O - WARM WATER
I - ROOM HEATING
RESERVED
Connect to the PCB 2 (CN1 L-IN)

NOTICE!

The manual switch board is use only if the necessary for test or repair. When the heat pump is running normally, the switch board must be in normal state.

1：The switch board is only for emergency, such as circuit boards were broken; and it must be operated by service engineer only.

2：When control systems are normal, it is forbidden to operate the switch board; the switch boards are only available when circuit board or compressor broken; before using the switch board, it must set and ensure the OPER. is OFF at the display.



A> NORMAL:

switch boards must keep the position as drawing then allow heat pump to runs normally.

B> ROOM HEATING:

room heating only; switch boards must keep the position as drawing then allow heat pump to heat room, the feed water temperature is fixed with 40℃; before using this mode, it must set and ensure the OPER. is OFF at the display .

C> WARMEATER:

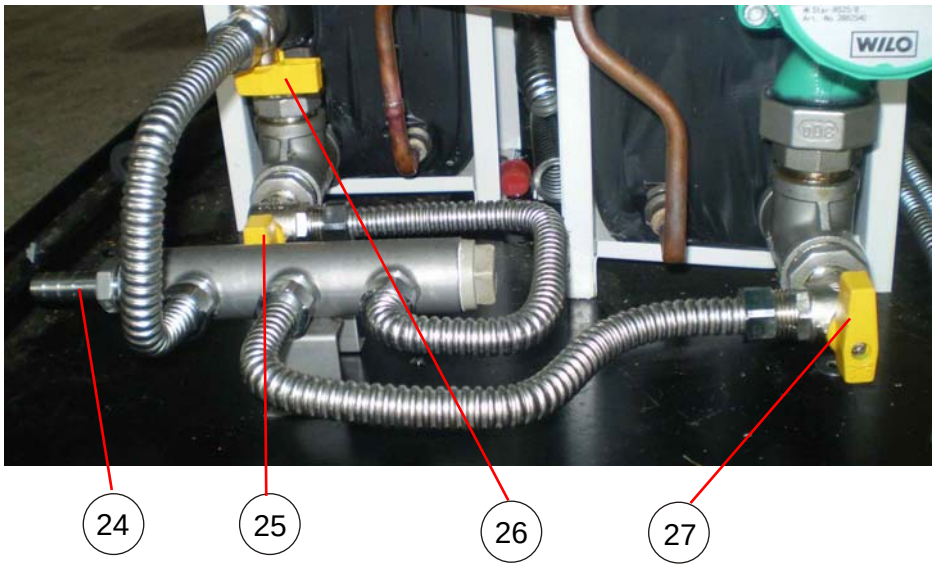
water tank heating only; switch boards must keep the position as drawing then allow heat pump to heat water tank, the feed water temperature is fixed with 70℃; before using this mode, it must set and ensure the OPER. is OFF at the display.

Draining, heat medium side

Close the shut-off valves in heating medium system. Open the drain valve (27). A small amount of water runs out, however, to fully empty the heating medium side requires the connector that joins the heating medium side and the connection on the heat pump VB-flow to be loosened a little to allow air to enter so the remaining water can run out. When the heating medium is empty the requisite service can be carried out.

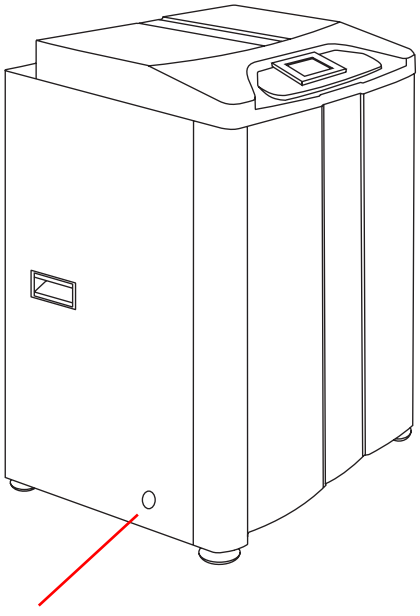
Draining, collector side

When replacing the brine pump or drive side or when cleaning the pump, the shut-off valves in the collector system should be closed. Open the drain valve (25,26) under the evaporator and loose the brine pump on the evaporator. The loose hose end can now be bent down and emptied in a small bowl. Now loosen the connection to **KB** a little to allow air to enter so the heat pump's collector side is emptied completely. When the circuit is empty the requisite service can be carried out.

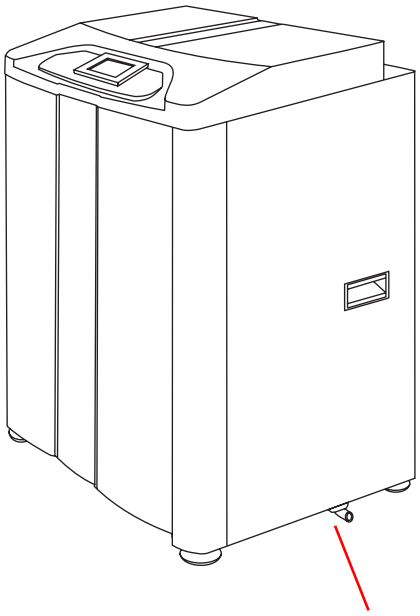


Draining, the chassis

The drain-pipe for the chassis is already assembled in advance before leaving the factory. The consumer is required to place the hose at appropriate location.



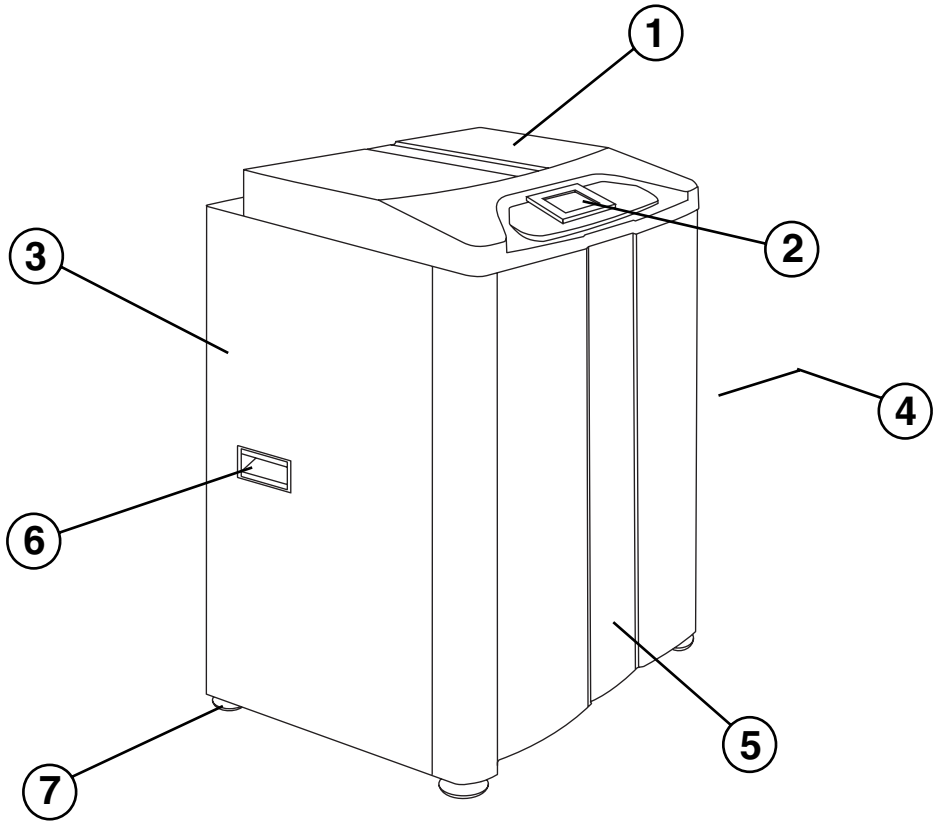
Draining Hole of heat medium system

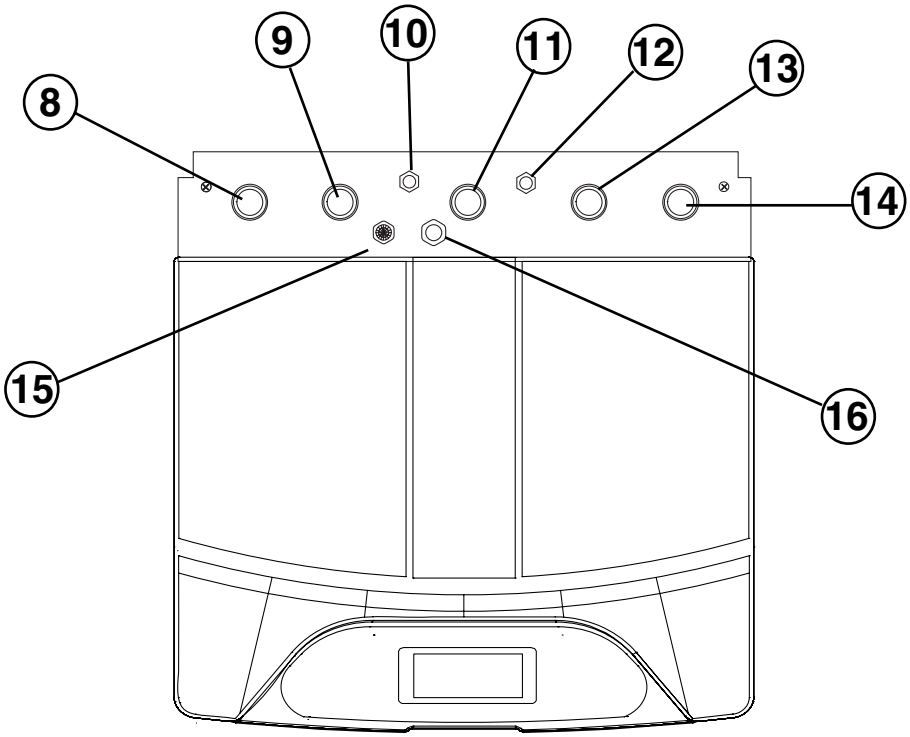


Draining Hole of the chassis

If the operating disturbance cannot be rectified by means of the above, an installation engineer should be called.

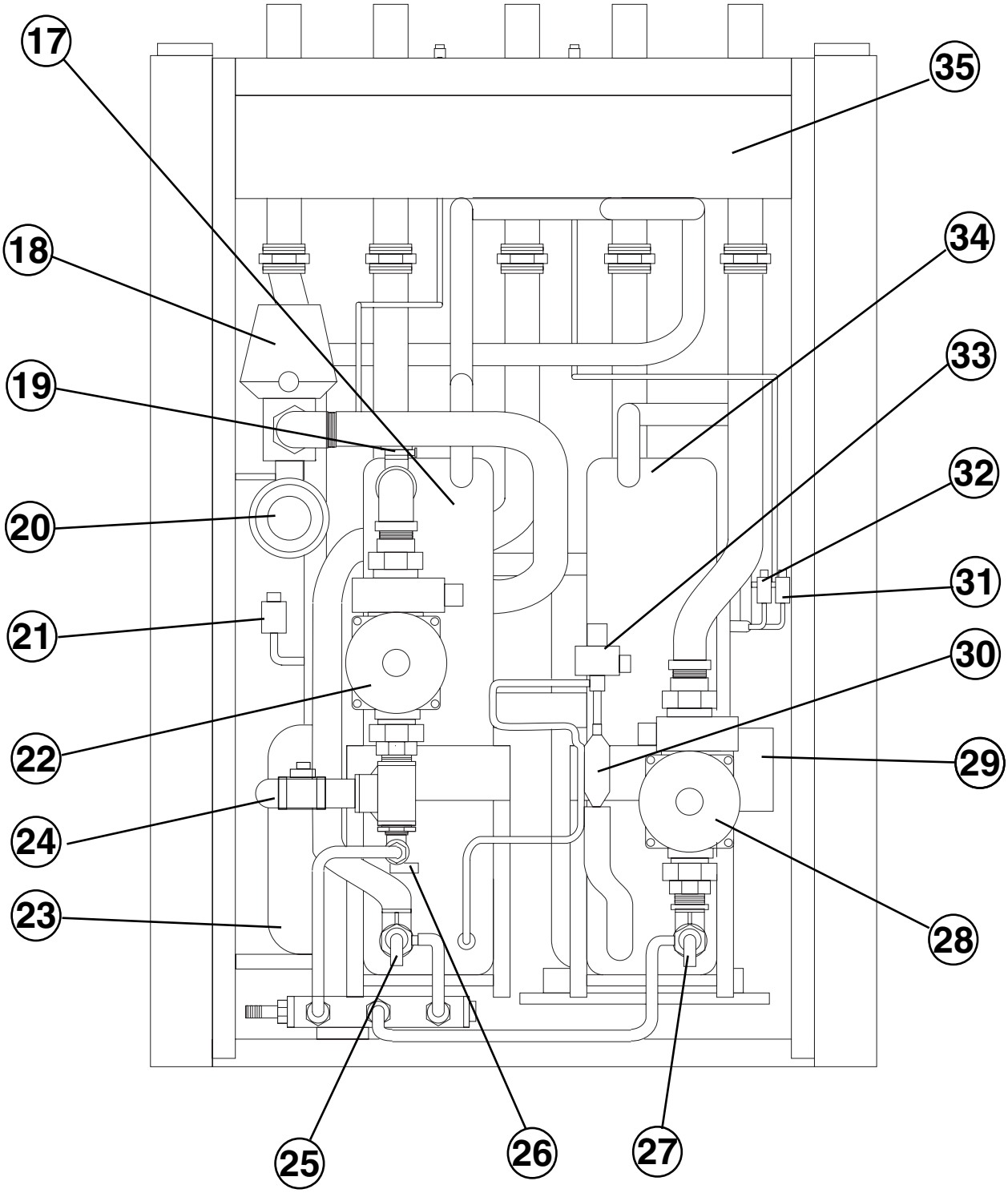
Component placement





Please Note : The picture for reference only !

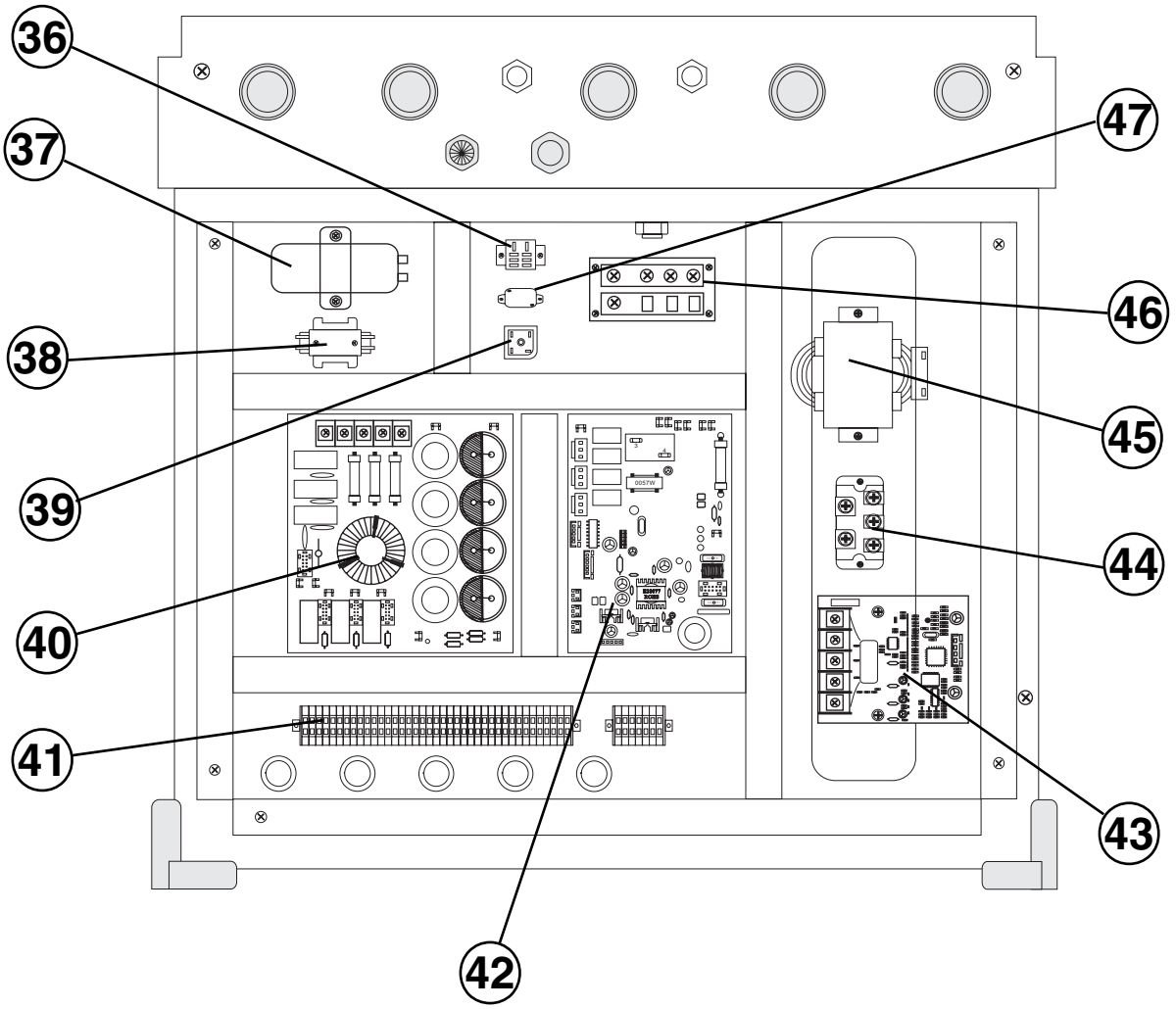
AGH-120WPDC3 for example

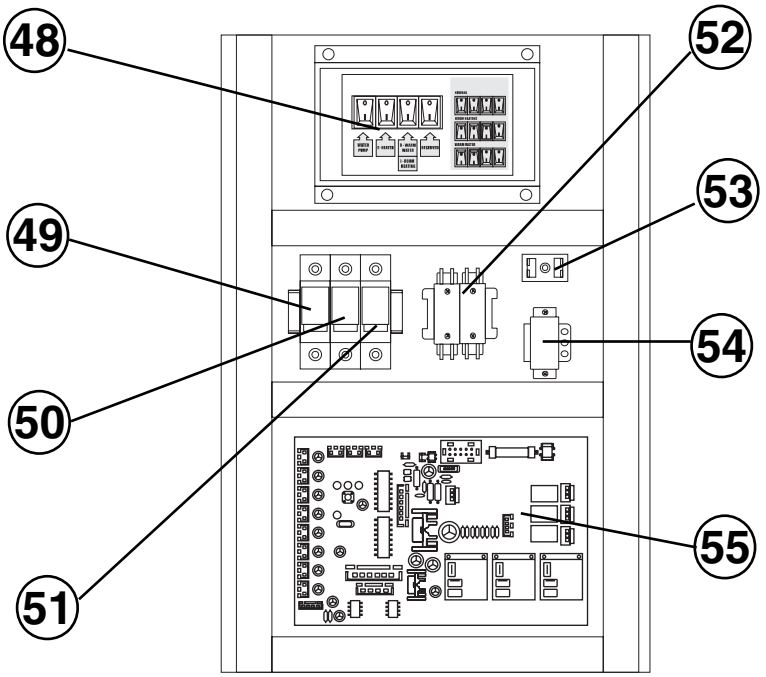


Please Note : The picture for reference only !

Component placement

3X380 V / 3 / 50 HZ



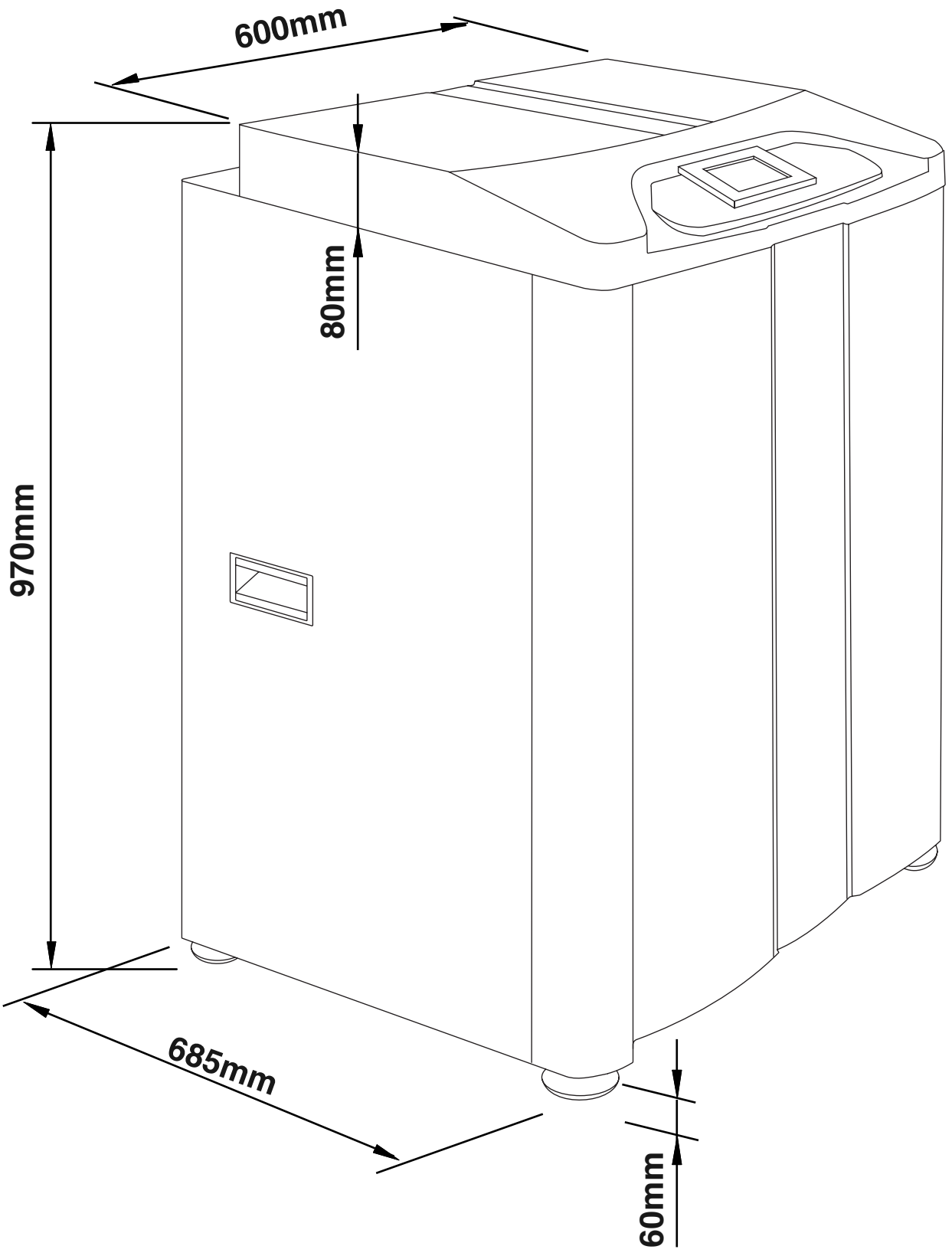


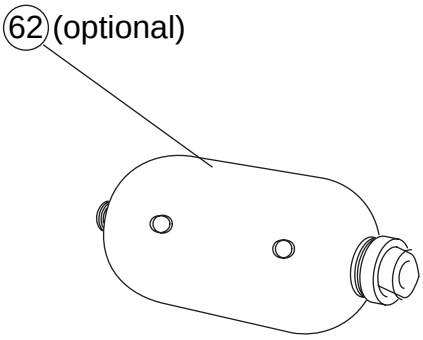
Please Note : The picture for reference only !

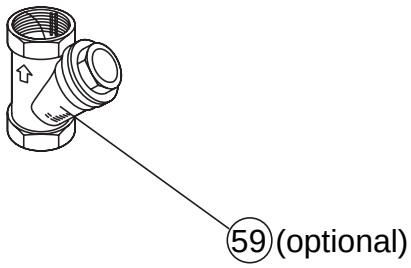
Please Note : The list is for reference only!

1	Plastic top board
2	Control panel
3	Left side board
4	Right side board
5	Front board
6	Handles
7	Stainless steel adjustable feet
8	Heating Flow pipe connection(To Water Tank) Ø 28 mm
9	Heating Flow pipe connection(To Floor) Ø 28 mm
10	Low pressure service valve
11	Brine Outlet Pipe Connection Ø 28 mm
12	High pressure service valve
13	Brine Inlet Pipe Connection Ø 28 mm
14	Heating Return Ø 28 mm
15	Temperature sensor connection hole
16	Power cord connection hole
17	Evaporator
18	Three-way valve for water flow
19	Automatic vent valve
20	Additional electrical heater
21	Low pressure pressostat
22	Brine pump (cooling medium pump)
23	Liquid refrigerant receiver
24	Water flow switch
25	Draining valve for evaporator
26	Draining valve for Brine Pump
27	Draining valve for heating system
28	Heating medium pump
29	Compressor
30	Filter
31	High pressure pressostat 1
32	High pressure pressostat 2
33	Expansion valve
34	Condenser
35	Electrical Control Box
36	Electric relay
37	Capacitor
38	AC contactor 1
39	Electrical Bridge 1
40	Power Board
41	Terminal Connector
42	Transition Circuit board
43	Module
44	Electrical Bridge 2
45	Reactance
46	Power Terminal Connector
47	PTC (Thermister)
48	Switch panel
49	Fuse 1 for Electrical heater 1
50	Fuse 2 for Electrical heater 2
51	Fuse 3 for Electrical heater 3
52	AC contactor 2
53	Public Terminals
54	Transformer
55	Main circuit board
56	Room temperature sensor
57	Outside air temperature sensor
58	Copper connectors
59	Particle filters (optional)
60	Drainpipe
61	Draining connector
62	Level vessel (optional)

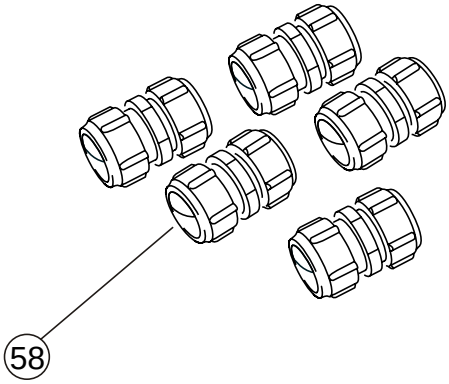
Dimensions and setting-out coordinates

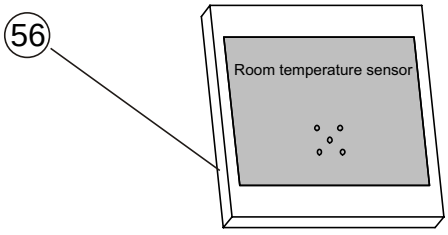


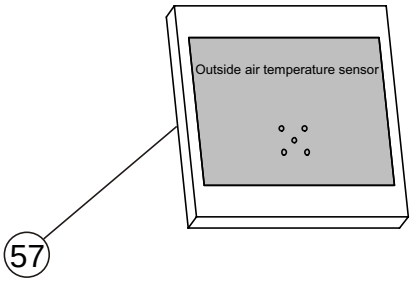


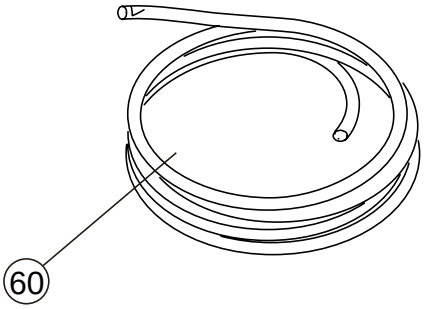


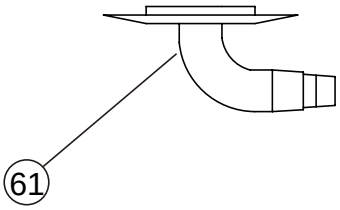
Enclosed kit











Technical specifications 3 x 380 V

CE IP 21 Refrigerant : R410A

Model		AGH-70WPDC3	AGH-90WPDC3	AGH-120WPDC3	AGH-150WPDC3
Heating Capacity	(KW)	6.900	8.900	11.850	14.500
Heating Power Input	(KW)	1.720	2.219	2.962	3.634
Test Condition	(°C)	B0/W35 according to EN 14511			
Power supply	(V/Ph/Hz)	380V/3/50Hz	380V/3/50Hz	380V/3/50Hz	380V/3/50Hz
Compressor brand		Hitachi	Hitachi	Hitachi	Hitachi
Compressor type		Rotary	Rotary	Scroll	Scroll
Starting current, compressor	(A)	1.5	1.5	2.5	2.5
Running current, (heating)	(A)	8.0	10.2	4.5	5.8
Maximum current	(A)	13.0	13.0	17.5	18.8
Operating current of electrical heater 6/9kw	(A)	13X2 (6kw)	13X2 (6kw)	13X3 (9kw)	13X3 (9kw)
Max Output, Brine pump	(W)	190	190	190	205
Max Output, Heating medium pump	(W)	190	190	190	190
Connection heating return, o.d.ø	(mm)	28			
Connection heating flow, o.d.ø	(mm)	28			
Water tank inlet/outlet, o.d.ø	(mm)	28			
Max pressure in spiral copper pipe	(Mpa)	0.25 (2.5 bar)			
Refrigerant quantity (R410A)	(kg)	1.40	1.60	1.85	2.20
Heating medium flow,Rated	(m^3/h)	1.20	1.50	2.05	2.50
Brine water flow,Rated	(m^3/h)	1.10	1.40	1.90	2.20
Max Discharge Pressure	(Mpa)	4.0	4.0	4.0	4.0
Max Suction Pressure	(Mpa)	0.95	0.95	0.95	0.95
Enclosure class		IP 21			
Noise of indoor unit	dB(A)	47	48	50	51
Net Weight/Gross Weight of indoor unit	(kg)	105/128	115/138	134/157	145/168
Dimension of Indoor unit (LxWxH)	(mm)	600x685x970	600x685x970	600x685x970	600x685x970